

Communicative Functions of Facial Displays in
Conversation

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ABSTRACT

Historically, most researchers investigating facial displays have focussed on facial displays solely as indicators of underlying emotion. Although facial displays have also been recognized as having a communicative function, research on facial displays as they are used in conversations has been scarce, as have experimental investigations of social factors that affect facial displays. The theoretical position underlying the studies reported here is that many displays are communicative. The first study examined facial displays used while discussing three diverse topics (planning a dinner menu consisting of disliked foods, a past conflict situation, and a "close call" situation). The resulting facial displays were analyzed in order to discover, inductively, the functions they served in the conversation. Both the syntactic and semantic linguistic functions were served by facial displays. The general categories found were syntactic displays, speaker illustrators, speaker comments, listener comments, and adaptors. Within these general categories, specific kinds of displays were also distinguished, for example, question markers, back channels, etc. The results demonstrated that facial displays convey a broad range of information that can be independent of as well as closely connected to the verbal messages.

In the second study, the social nature of the situation was experimentally varied in order to examine the effect of social factors on the frequency of facial displays. Subjects listened to "close call" stories in one of four conditions: Face-to-face, Partition, Telephone, and Alone. The results supported the hypothesis that the visual availability of a receiver was the important factor in determining whether motor mimicry displays would be produced. The study demonstrated that facial displays are used to convey information about the listener's understanding and appreciation of what was being said. Together, the studies provide a better understanding of how facial displays are used in conversation.

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CHAPTER 1

While working in New Guinea, anthropologist Gillan Gillison had the following experience:

At a premarriage ritual for women only, in a dim crowded hut, I worked hour after hour with my lantern, tape recorder and note pad, feeling painfully hot and thirsty. At last sugarcane was passed around. I could hardly wait. But I was passed by. I was hurt, and said so later to [my husband and daughter] Samantha. She said, "Mommy were you smiling? I said yes, of course, in anticipation of the refreshing sugarcane. "Well, that's why you didn't get any. Nobody has to give you anything to please you when you are already pleased. When I want something, I frown and look away. Then I always get a lot, so I won't be angry."

(cited in Key, 1980, pp. 25-26)

The purpose of the research described in this paper was to provide a better understanding of facial displays as communication in social interactions. The possibility that facial displays can convey diverse kinds of information (other than just emotion) has been suggested but never fully or systematically explored. Based on the assumption that facial displays frequently occur in conversations, it was of interest to learn more about linguistic functions of facial displays, specifically, how facial displays work in conjunction with the verbal content to produce conversation. Therefore one goal of this research was to establish whether facial displays could be differentiated in terms of the kind of information they convey.

The second goal of this project was to test the theory that

facial displays are primarily communicative and thus are subject to social factors which regulate their occurrence. Specifically, a second study was designed to test the importance of the visual availability of a receiver in determining the occurrence of facial displays in interactions.

The term "facial display" refers to facial movement or muscle action that is not the result of talking or physiological activity (e.g., swallowing). It is not assumed in this research that the facial display is tied to an underlying emotion state. Indeed, the term "facial display" is used rather than "facial expression" because "facial expression" is often used in reference to a facial action in which there is an assumption of an emotion¹ occurring at the same time and the emotion is causing the expression. No such assumption will be made here. This is not to deny that emotions (however defined) exist or that facial movements may convey information about various emotions; however, the purpose of the present studies was to study facial displays as they occur in conversation rather than to establish the connection between facial displays and underlying emotional states.

The term "social" refers to the presence of at least one other person in the situation or to a situation in which two or more people are interacting. "Social displays" are defined as facial displays that occur in the presence of others or in interactions with others. "Linguistic functions" of facial displays refers to semantic and syntactic functions of facial displays. The term "linguistic" is used because of the assumption that facial displays work closely in

conjunction with the verbal content to produce the conversation.

This dissertation is divided into five chapters. The rest of this chapter provides an historical overview of the dominant literature on facial expressions of emotion. In Chapter 2 various theories of facial expressions and displays are reviewed. The theory underlying the present research is presented at the end of this chapter. Chapter 3 begins with a review of the studies that have examined conversational facial displays. Following this, the method, results, and discussion of the first study in this project are presented. In Chapter 4, the previous literature on social factors affecting facial displays is reviewed. The rationale, method, results, and discussion of the second study follow this review. The results and implications of both studies are discussed in Chapter 5 as well as future directions for research on facial displays.

Historical Review of Research on Facial Expressions of Emotion

Darwin's Observations on the Expression of Emotion

The study of facial expressions has been a subject of scientific interest for over 100 years. Darwin (1872/1965) has typically been credited with the first systematic study of facial expressions. Although there were others before him who shared an interest in facial expressions (e.g., Sir Charles Bell, 1806; Duchene, 1862), Darwin's work has been the foundation of most of the theoretical and empirical research in this century.

Darwin was interested in determining which movements of the face and body were related to states of the mind as well as speculating on the origin of these expressions. He arrived at three general principles which he believed were the origins of most facial expressions and gestures used by humans and animals: (1) Principle of servicable associated habits — certain actions originally performed to gratify a need or desire come to be performed through force of habit whenever the same state is aroused, even if the movements are of no use; (2) Principle of antithesis — states of minds opposite to those discussed in Principle 1 result in movements which are also opposite in nature to the movements discussed in Principle 1; and (3) Principle of actions due to the constitution of the nervous system — certain expressive movements are a direct action of the nervous system and are caused by an excess of "nervous energy".

Darwin argued that facial expressions were functional; they were adaptive in that they provided information about internal states (emotions) that aided in coordinating social behaviour. They also

enabled animals to communicate information about internal states without having to engage in behaviour associated with these states and risk physical injury.

Darwin based these ideas on observations of expressions of infants, the insane, the old, other races, paintings and sculpture, and common domestic animals. He asked others to observe and report to him what they had seen. Darwin also collected evidence to demonstrate there was a continuity in facial expressions from animal to man. He believed that many (but not all) facial expressions were innate and that animals and humans have an innate capacity to recognize emotional expressions within their own species.

He saw emotional processes as being directly and closely related to emotional expression:

Most of our emotions are so closely connected with their expression, that they hardly exist if the body remains passive...

(p. 237)

The free expression of outward signs of an emotion intensifies it. On the other hand, the repression as far as this is possible, of all outward signs, softens our emotions. (p. 365).

In other words, expressive behaviour was seen as both a consequence of an underlying emotion and a regulator of emotion.

Although Darwin was more interested in the role of expressions in conveying emotions, he also saw human facial expressions playing an important role in communication, that is, they added information to the verbal content: "The movements of expression give vividness and energy to our spoken words" (p. 364).

Since Darwin, there has been considerable work devoted to the study of facial expressions. The history of this research can be divided into three periods: between 1900 and 1940, the study of facial expression flourished; between 1940 and 1960, research in this area almost disappeared; and from 1960 to present, interest has resurfaced again. The focus in the majority of the studies has been on expressions of emotion rather than how the facial displays contribute to discourse. Research on expressions of emotion has proceeded along two lines: component studies and judgement studies. In component studies, the focus is on "what the measurement of facial components can indicate about some aspect of a person's experience" (Ekman, Friesen, & Ellsworth, 1982c, p. 87). For example, the various muscles of the face have been analyzed as to the role each muscle plays in the display of various emotions. In judgement studies, observers are typically asked to identify the emotion perceived from a photograph of a face.² Observers either select the label they feel corresponds to the facial expression from a set of emotion categories or rate each face on a series of dimensions or scales. In the following section, research on adult facial expressions will be reviewed chronologically. Both component and judgement studies will be covered. This review is not intended to be comprehensive but rather is aimed at covering the major issues involved in the study of facial expressions.

1900 to 1940

Some of the earliest work on facial expressions focussed on the measurement of the various muscles involved in each expression. For example, Frappa (1902) and Tichener and Boring (1923) both studied emotional expressions in terms of the muscle contractions involved in each expression. Frappa saw three expressions (surprise, joy, and grief) as forming the basis for all facial patterns. Krukenberg (1920) analyzed various art materials, caricatures, pictures of onlookers at accidents, and other materials in terms of the muscles that were involved in forming various expressions.

Other scientific efforts were directed toward discovering how well facial expressions communicate information about emotions. Early work on posed facial expressions (e.g., Feleky, 1914; Langfeld, 1918; Ruckmick, 1921) found that subjects could identify various emotional expressions with considerable accuracy. Landis (1924a, 1924b), however, questioned the generalizability of these studies to spontaneous expressions. He found a number of differences between posed expressions and actual expressions of emotion in his studies and suggested that experiments involving posed expressions were "really studies of the accuracy of observation and the recognition of traditional expression rather than the normal facial expression in emotion" (p. 450).

Dissatisfied with the previous studies that had been done, Landis conducted his own studies in order to describe and analyze facial and head reactions of individuals during situations designed to elicit emotional responses. Subjects were seated in a room, "wired"

for physiological measures, and photographed as they reacted to the experimental situations. The situations ranged from mildly emotional situations such as listening to music or smelling ammonia, to moderately emotional situations such as looking at pornographic pictures, to such extreme emotional situations as being electrically shocked, touching frogs in a pail, and decapitating a rat (or watching the experimenter cut off the rat's head).

Facial reactions were scored for which muscle groups were involved in the expression. Contrary to the belief that there are typical expressions for certain emotions (or emotional situations), Landis found there were no typical expressions that characterized any of the situations.

One possible explanation was that subjects were not reacting similarly to the situations. To investigate this possibility, Landis examined the expressions given by individuals who had reported feeling the particular emotion of interest but found "no correspondence between the expressive facial reactions and the subsequent verbal characterizations of those situations" (1924b, p. 493). Subjects were also asked to imagine themselves in the same situations that they had just experienced, and again no expressions were found that characterized any one situation.

Landis did find that subjects differed in the facial expressions they typically displayed. "Certain subjects favor certain muscles or certain muscle groups and fail to use others" (1924b, p. 483). Subjects showed individual differences both in the real and imagined situations.

Posed expressions were also examined. Landis asked subjects to produce facial expressions corresponding to their reported feelings. The expressions they made "could for the most part be readily recognized as the traditional expression of [the emotion]" (1924b, p. 483).

Landis found that subjects did respond similarly in terms of their physiological reactions. However he found there was no correspondence between the physiological measures and the verbal reports. Unfortunately, he did not mention whether he examined the relationship between physiological measures and facial reactions.

Landis concluded from his research:

it would seem from this that the expressions which writers such as Darwin, Bell, and Krukenberg have discussed, analyzed and attempted to explain are in reality social expressions of the nature of language gestures and are not really definite patterns of emotional response. (1924b, p. 484)

In other words he believed that a distinction should be made between social (posed) and emotional (spontaneous) expressions. It is important to note that Landis used the term "social" differently from how it is defined in the present research. He used the term "social expressions" to refer to conventional facial expressions that are produced when a person is asked to pose a particular expression. He believed that "true" emotional expressions were the more idiosyncratic expressions he saw in his study.

Landis (1929) used photographs from his earlier study (1924b) in a judgement study of emotional expression. Observers judged the

photographs and described in their own words the emotion, the situation that might have elicited the expression, and how certain they were about the emotion judgement. Photographs of subjects as they experienced the situations and photographs of subjects who tried to reproduce their earlier reaction to the situation were included as stimuli. Landis found that there was no relationship between the observer's ratings and the subjects' introspective reports about how they felt in the situation. Furthermore, observers were not very accurate in judging the expressions of subjects who attempted to reproduce their reactions. Landis concluded that observers could not guess the emotion any better than chance. He believed that our day-to-day interpretations about what a person was feeling are more accurate because they are based on both the expression and the situation.

Early reviews of the literature on facial expressions of emotion between 1900 and 1940 (Hunt, 1941; Bruner & Tagiuri, 1954; Tagiuri, 1968) concluded that there were

no consistent answers to most fundamental questions about the accuracy of information provided by facial expressions, their universality, and possible innateness, etc. (Fridlund, Ekman, & Oster, 1987, p. 143)

Ekman et al. (1982c) disagreed with the conclusions drawn by these early reviewers regarding the accuracy of information given by facial expressions. In their re-analysis of the early research, Ekman et al. excluded studies which had used artist's drawings because of the questionable relevance of these studies to the issue of accuracy.

They also discredited Landis's (1924,1929) findings because of various problems that threatened the validity of his results. The criticisms included the possibility that there was cumulative emotional disturbance or carryover of emotion from one situation to another, that the situations were not emotion specific for each subject, and that subjects may have masked or inhibited their expressions (because they were aware that their facial expressions were being studied). After re-analyzing the remaining early studies, the authors concluded that the evidence is positive with regard to the accuracy of judgements of both posed and spontaneous expressions. However, as they pointed out, "the evidence based on posed behaviour is far stronger than that based on spontaneous behaviour" (p. 86).

1940 to 1960

During the period between 1940 and 1960, interest in facial expressions declined. Schlosberg (1941, 1952, 1954) carried on work started by Woodsworth (1938) on verbal dimensions underlying emotion categories. However, the components of facial expressions and the accuracy in judgements of facial expressions received almost no attention. Coleman (1949) examined the accuracy of judgements using films of two stimulus persons reacting to various situations as stimuli for his judgement study. In contrast to Landis' (1929) study Coleman found that observers' judgements were more accurate than would be expected by chance. However, Coleman asked his observers to pick the situation rather than to judge what emotion was being displayed. Subjects were given a list of nine situations, eight of which were situations actually used.

1960 to Present

During the 1960's the topic of facial expressions resurfaced, and facial expressions were studied in terms of how they provided information about emotions and personality. Ekman, Friesen, and Ellsworth (1982a) noted that this renewed interest was influenced in part by Tomkin's (1962, 1963) and Plutchik's (1962) theories of emotion, which emphasized facial expressions. Between 1970 and 1987 there have been three reviews of the literature on facial expressions of emotion. Ekman and Oster (1979 and 1982) reviewed the field from 1970 to 1980. Fridlund, Ekman, and Oster (1987) have provided an update and expansion of the earlier reviews and included research up to 1983.

The research covered in these reviews has focussed on a number of different areas pertaining to emotion, including investigations of neuromuscular and non-neuromuscular mechanisms responsible for the generation of facial expressions, investigations of primate facial expressions, development of facial expressions in infants and young children, measurement of facial action, accuracy studies of facial expressions of emotion, ability to encode expressions, the relationship between facial expressions and the autonomic nervous system, facial feedback, and studies of facial expressions and psychopathology. Given that the number of areas covered and the issues that have been covered are numerous, only the research that has investigated facial expressions as a means of conveying emotion information will be reviewed (i.e., not neuromuscular mechanisms, primate expressions, developmental issues, etc.).

In the few component studies that have been done, there is evidence that facial expressions can provide information about the intensity of the emotion. For example, using the Facial Action Coding System (FACS), Ekman, Friesen, and Ancoli (1980) measured subjects' facial expressions while watching positive and negative film stimuli. They found moderate correlations between facial actions hypothesized to reflect positive or negative emotions and ratings of the intensity of these emotions by the subjects. They also found that facial actions could be reliably distinguished for one emotion, self-reported disgust. Other studies reviewed by Fridlund et al. (1987) reported electromyographic (EMG) activity, that is, activity resulting from facial muscle contractions that is not necessarily visible to the human eye, differed for various emotions.

Judgement studies of spontaneous facial expressions have found that observers can accurately judge general positive versus negative (or pleasant versus unpleasant) emotional states (Fridlund, et al., 1987; Ekman, et al., 1982c).

Studies involving posed expressions of emotion have found that observers are quite accurate in their judgements; that is, observers guessed the emotion being posed more times than expected by chance. Seven emotions were judged from posed expressions with relatively high accuracy: happiness, surprise, fear, anger, sadness, disgust/contempt, and interest (Fridlund et al, 1987). Level of accuracy of judgement, though, has varied from 35% to 100%, depending on the particular emotion category and study (Ekman, Friesen, & Ellsworth, 1982c).

Another approach to studying facial expressions has focussed on discovering dimensions that underlie emotion categories. These dimensions are used to describe differences in facial expressions associated with various emotions. Examples of dimensions that have been found in various studies are: active to passive, pleasant to unpleasant, and simple to complicated. Photographs of posed facial expressions were used in all studies. Ekman, Friesen, and Ellsworth's (1982b) review of the literature revealed that the only consistent finding across studies has been the dimension of pleasantness/unpleasantness (Ekman, Friesen, & Ellsworth, 1982b).

Fridlund et al. (1987) noted two other general findings: Individual differences have been found in both encoding and decoding of facial expressions of emotions. "Encoding ability", as used in this context, refers to the accuracy with which people can represent the emotion using facial actions. "Decoding ability" refers to the accuracy with which an individual can decipher the meaning (i.e., the emotion) of other people's facial expressions. One consistent finding is that women are slightly better than men in encoding and decoding facial expressions. In addition, Buck (1980) noted that women have also been found to be more facially expressive than men while viewing emotionally loaded slides. It is not clear, however, what other factors (e.g., personality traits) account for the individual differences that are found (Fridlund et al., 1987).

In addition, all three reviews found support for universality of expressions of happiness, anger, disgust, sadness, and combined fear/surprise. Evidence for this was based on judgement studies done

with both literate and preliterate cultures using judgements of posed as well as some spontaneous expressions.

One major limitation of the conclusions that are offered in these reviews is that they are based for the most part on judgement studies. Only a few component studies have been done. The focus has been on how observers decode facial expressions (from photographs or videotapes) and seldom on how facial expressions are spontaneously formed. In addition, the facial expressions used in the judgement studies have been, for the most part, posed rather than spontaneous expressions of emotion. The extent to which results from studies that used posed expressions can be generalized to spontaneous expressions has been debated. Ekman, Friesen, and Ellsworth (1982c) argued that results from posed facial expressions studies can be generalized to spontaneous behaviour. They proposed that posed expressions

are not dissimilar from all spontaneous behaviour but approximate spontaneous facial behaviour that occurs when a person is not applying display rules to deintensify, mask, or neutralize. However, poses of extreme, uncontrolled emotion may still differ from spontaneous, unmodulated, high-intensity emotion in duration and in complexity of muscle use (p. 85).

Other investigators have disagreed with this idea and have presented evidence to demonstrate important differences between posed and spontaneous facial expressions. Buck (1984) reviewed the literature on neurochemical systems of emotional expression and found evidence which suggests there are important differences between the two types of expressions. For example, in his review, he found "evidence that

some voluntary facial movements are dependent upon pyramidal pathways, [whereas] spontaneous facial expressions are associated with nonpyramidal systems" (p. 74). Buck also reviewed clinical studies of various types of brain damage that differentially affect the two types of facial expression. Damage to the left hemisphere can produce communication deficits known as aphasia. In aphasia verbal communication is particularly affected. However, as Buck pointed out, problems with symbolic nonverbal communication are also often found (e.g., Duffy & Duffy, 1981, Duffy & Pearson, 1975; Goodglass & Kaplan, 1963). Spontaneous expressions are not affected by damage to the left hemisphere. Buck also noted however, that it is unclear whether the deficits in symbolic nonverbal communication are a communication deficit or an inability to perform voluntary movements (e.g., Goodglass & Kaplan, 1963). In contrast, right hemisphere damage results in the opposite deficits; spontaneous expression is reduced whereas symbolic or voluntary expressiveness is not affected.

Until we know more about the relationship between spontaneous and voluntary expressions, it is not possible to know whether results from posed expressions can be generalized to spontaneous expressions. In addition, the extent to which results from studies that have elicited expressions while subjects have been alone and unaware that anyone was watching can be generalized to expressions elicited in social situations is also unknown. To date there have been only a few studies which have examined the use of facial expressions by individuals when they are interacting with others.

Fridlund et al. (1987) noted there has been only one study which

has attempted to estimate the frequency of emotional expressions in interactive situations. They described Ekman and Friesen's unpublished study which analyzed the various expressions that occurred in a sample of psychiatric interviews of patients with mainly affective disorders. In a sample of almost 6000 facial actions, less than one third of them were classifiable as emotional expressions. The authors thought this number might have been an overestimate because "the patients interviewed were mostly discussing their feelings" (Fridlund et al., p. 161).

In summary, there is evidence that people can agree better than chance on what emotion labels should be assigned to photographs of posed expressions of happiness, sadness, surprise, fear, anger, disgust/contempt, and interest. In view of the limited number of studies on spontaneous expressions, it would be premature at this time to draw any conclusions about encoding or decoding of these expressions. Finally, there have been virtually no studies of emotional expressions as they occur in social interactions.

CHAPTER 2

THEORIES OF FACIAL DISPLAYS

The study of facial displays has attracted interest from a number of different disciplines, including psychology, ethology, and interpersonal communication. The various disciplines have sought answers to different questions and have developed their own theories and approaches to the study of facial actions. In the following section, the various theories that are currently being used to understand facial displays will be reviewed. It should be noted that each theory will receive only brief consideration in this review. Summaries of the emotion theories presented here are limited to the parts of the theory that are relevant to facial expressions. Readers who are interested in obtaining more detail about the treatment of emotion in these theories are referred to the original sources.

Classical Emotion Approach

Psychological theories of facial expression have, for the most part, concentrated on facial expressions of emotion. In these theories facial expressions are viewed as expressions of an underlying state of emotion. They are regarded as "readouts" or "spillovers" of the emotion:

The classical view holds that facial displays (except for paralinguistic and deceptive ones) are prepotent, involuntary readouts of emotion that emerge unless effortfully masked or suppressed. (Fridlund, in press, p. 44)

In other words, the expression is seen as an outward manifestation of an internal state. In these theories, the focus is primarily on

understanding the phenomenon of emotion (however it is defined) and only secondarily on the facial expression. Facial expressions are typically viewed as one component of the emotion.

Emotion theories of facial expressions posit two kinds of facial expressions of emotion: expressions of an ongoing emotion and expression of an emotion that is not presently occurring, that is, the portrayal of an emotion (Fridlund, in press).

As the reader will recall, Tomkins's (1962, 1963) emotion theory was influential in renewing interest in the study of facial expressions in the 1960's (Fridlund et al., 1987). Tomkins viewed affect³ as the "primary innate biological motivating mechanism" (1982, p. 354) in the sense that affects function as amplifiers of various motives. Without this amplification, the individual would not be driven to action. Tomkins distinguished nine innate affects: interest or excitement, enjoyment or joy, surprise or startle, distress or anguish, fear or terror, shame or humiliation, contempt, disgust, and anger or rage. These affects are seen as "innately patterned responses" to affective stimuli, and the responses are expressed through bodily actions, particularly facial expressions. The affects are believed to be based on a neurophysiological program located in the central nervous system and associated with specific and universal facial expressions.

Tomkins acknowledged that facial expressions serve a communicative function. However, he treated this function as secondary to the function of motivating a person to action. He stated that although

complex affect displays on the human face [may have] evolved primarily as communication mechanisms rather than as sources of motivating feedback ... my intuition was, and still is, that the communication of affect is a secondary spin-off function rather than the primary function. (p. 387)

In addition to contributing to the resurgence of facial expression research, Tomkin's theory has also influenced both Izard's and Ekman's theories of facial expressions and emotion.

Izard (1977) proposed that emotion consists of three components: (1) neurophysiological component, (2) neuromuscular component (facial activity and patterning and to a lesser extent postural activity as well), and (3) subjective or phenomenological component. The three components interact to produce emotion. The patterns of emotional facial responses are hypothesized to have a corresponding genetically based neurological program.

When neurochemical activity, via innate programs, produces patterned facial and bodily activities, and the feedback from these activities is transformed into conscious forms, the result is a discrete fundamental emotion... (p. 49)

Izard proposed the same basic list of emotions as Tomkins.

Communication of emotion via facial expressions is seen as being crucial to development of social bonds and interpersonal relationships:

The face is the supreme center for sending and receiving social signals that are crucial for development of the individual, interpersonal communication, and the cohesiveness of the family

and society. (p. 67)

Initially, facial expressions of emotion occur reflexively as part of the emotion process. However, through experience and socialization, individuals learn to control and alter their facial expressions.

Therefore, although expressions are viewed as "innate, pancultural, and universal phenomena" (p. 64), they are also seen as being subject to culturally determined display rules that dictate when and which expressions will be displayed.

In addition, Izard has also theorized that facial expressions can contribute to the subjective experience of emotion (the "facial feedback" hypothesis). The facial feedback hypothesis holds that the expression of emotion can influence the subjective experience of emotion. When the emotion is facially expressed it is more intensely experienced, whereas if the facial expression is repressed the emotion is less intensely experienced. These facial expressions need not be perceptible but, rather, may be micromomentary expressions.

Ekman (1977) offered what he called a "neurocultural account of emotion" which includes both biological and social determinants of emotion. Emotion refers to

the process whereby an elicitor is appraised automatically or in an extended fashion, an affect programme may or may not be set off, organized responses may occur, albeit more or less managed by attempts to control emotional behaviour. (p. 61)

Emotional responses consist of six different response systems:

- (1) skeletal muscle responses,
- (2) facial responses,
- (3) vocal responses,
- (4) coping behaviours,
- (5) autonomic and central nervous

system changes, and (6) subjective experience. These response systems are seen as being interrelated, and the changes in each system are believed to be distinctive for each emotion. Ekman's model proposes that emotional stimuli set off a response in one or more of the physiological systems underlying the primary affects. Although facial expressions are believed to be innately tied to the primary emotions, the expression of the emotion can be affected by display rules. In other words, Ekman agrees with Tomkins and Izard that emotional expressions are innate and pancultural but are subject to culturally learned display rules.

Buck (1984) has also presented a theory of facial expressions of emotion. Emotions are conceptualized as states associated with subcortical and paleocortical neurochemical systems and which include a subjective experience and bodily response including facial expressions. He proposed that an emotional state is transformed into a facial response via

a central encoding mechanism in the central nervous system which transforms the information that a given motivational/emotional state is present into motor neuron activity which influences the facial muscles. (p. 18)

Communication of emotional information is seen as crucial to the regulation and coordination of social behaviour. Buck proposed a version of Shannon and Weaver's (1949) model of communication (encoder/decoder) to understand the communication process. The encoder is the sender or the person who is making the facial expression and the decoder is the person who is seeing the facial

expression and must decide what it means. In Buck's model, sender and receiver are viewed as being able to exchange roles at any point in time, and communication is assumed to involve a number of different channels (e.g., words, intonation, nonverbal behaviours). Buck also includes the notion of display rules as a way of explaining why people do not always express what they are feeling.

In summary, the psychological emotion approaches have viewed facial expressions as being caused by (or closely associated with) an underlying emotion. When an emotion is evoked, a corresponding expression is also produced unless display rules are invoked. For the most part, these expressions are viewed as serving a communicative function in that they convey emotion information to others. However, precisely how these expressions work in social interactions is not explained, except for references to unspecified "display rules". These theories are also limited in that they do not consider or attempt to account for other (non-emotional) kinds of facial displays.

Ethological Approach

In contrast to the "emotion" approaches, animal and human ethologists have tended to emphasize the use of facial displays as social signals. They have criticized psychological theories for their emphasis on underlying states and their use of methods that neglect the communicative significance of facial displays. For example, Kraut and Johnson (1979) argued that

although workers in this tradition have emphasized the importance of facial expression in communication and social behaviour, they have rarely studied such communication in natural

social settings by studying the causes and consequences of [for example] smiling; rather, they have focused on the recognition and verbal labeling of emotions in facial expressions, generally in still photographs. (p. 1540)

Kraut and Johnson further argued that by focussing on the relationship between facial expression and internal states, the psychological approach treats individuals as "socially encapsulated". Although the communicative importance of facial expressions is recognized in psychological theories, this is usually limited to the communication of information about emotion. Kraut and Johnson pointed out this is based on the assumption that people decode primarily emotion information from facial expressions in their daily interactions—an assumption that has not been empirically tested. In fact, there is some evidence to the contrary: Frijda (1953) found that when subjects were asked to give free interpretations of photographs of various facial expressions, they tended to describe the pictures in terms of possible situations (e.g., she looks as though she is watching a small child playing), rather than offering emotion labels.

Ethologists advocate a naturalistic observational approach to the study of behaviour. Their focus is on the proximate causes of displays, their (social) consequences for the immediate interaction, and their evolutionary functions. Smith (1977) has presented an information-oriented message approach combined with an interactional perspective. Animal displays are viewed as informative messages that serve to reduce ambiguity about the situation (e.g., indicating the

animal's probable future behaviour). These displays are also recognized as being interactional in that they affect the other animals' behaviours.

Similarly, the ethological approach to human nonverbal behaviour views the individual as part of a social network. The focus is on interactions between people and the effects of nonverbal behaviours on others. Social determinants are believed to be important factors in the display of particular nonverbal communications. Kraut and Johnson (1979) hypothesized (and presented evidence) that social involvement is the major cause of smiling, which is largely independent of the person's emotional state (see Chapter 4 for further details).

Interpersonal Communication Approach

Human communication theorists (e.g., Watzlawick, Beavin, & Jackson, 1967) have also viewed nonverbal behaviours as communication rather than indicators of intrapsychic states. One group of interpersonal communication researchers have examined a particular kind of facial display—motor mimicry—in a social context (Bavelas, Black, Lemery, & Mullett, 1986b; 1987). Motor mimicry as a nonverbal expression of empathy (e.g., wincing for someone else's pain) had traditionally been viewed as a behavioural indicator of underlying vicarious emotion, and its communicative importance had been neglected. Bavelas et al. (1986b) proposed that motor mimicry is more an expression to another person than an expression of an intrapsychic state. Specifically, motor mimicry communicates to the other person the observer's awareness and understanding of the other person's situation. These authors argued and provided evidence that although

the observer may at the same time experience similar emotion, the inner feeling and the facial expression are parallel processes.

Bavelas et al. (1986) summarized their perspective by stating:

Expressive behaviours in particular are not an inadvertant by-product of a private experience but are primarily and precisely interactive; they are constant evidence that in our social behaviour we are intricately and visibly connected to others. (p. 328)

Structural Approach

The structural approach views communication as a multichannel behavioural coding system which includes language, gestures, conversational facial displays, as well as other nonverbal behaviours. Communication is viewed as an organized and self-contained system that operates according to a set of rules (Duncan, 1969). These rules dictate which behaviours will occur and in what context. The goal of structuralists is to identify units of communicative behaviours and to explore the relationship among these units in social interactions. In other words, they seek to uncover the organization of the various verbal and nonverbal behaviours. Examples of the structural approach are Birdwhistell's (1966) work on body motion, Trager's (1958) exploration of vocal qualities such as intonation, pitch, etc., and Scheflen's (1966) study of interpersonal structures of communication. Buck (1984) pointed out that spontaneous facial expressions of emotion are not typically included as part of communication.

In summary, it can be seen that the psychological approach emphasizes the relationship of facial expressions to underlying

emotion processes within the individual whereas the ethological, communication, and structural approaches to facial displays emphasize the communicative aspect of such displays.

Facial Displays as Communication

The theoretical approach underlying the present research is similar to approaches advocated by the ethologists, structuralists, and communication researchers. This approach differs from the classical "emotion" approach in that no assumption is made that facial expressions are tied to underlying emotions. As Kraut and Johnson (1979) pointed out, a social approach is more parsimonious than the classical emotion approach in that there is no need to invoke the occurrence of an emotion when there is no independent evidence of an emotion occurring.

The major theoretical assumption made is that facial displays are primarily communicative: they are used to convey information to other people. The information that is conveyed may be emotional information but may also be other kinds of information as well, for example, syntactical information, indications that the speaker is being understood, relationship definition, listener responses, etc. Facial displays are used in conjunction with other behaviours (both verbal and nonverbal) to produce conversation.

Facial displays can function within the interaction as communication on their own, that is, they can send a message independently of other communicative behaviours. The facial emblem (e.g., wink) is one example of a facial message that is independent of other communicative behaviours. Other displays may be quite stylized

and through this stylization convey easily decoded information. An example of this type of display is the disgust reaction. Kendon (1973) and Brunner (1979) have both observed that facial displays by the listener can act as "comments" upon what the speaker is saying. For example, Brunner hypothesized that smiles can provide information about listener agreement or disagreement. Evidence that they provide commentary information is provided by the fact that these facial displays have been found to occur at specific points in relation to the speaker's behaviour. The information contained in these comments is provided solely by the facial actions. In addition, it is also possible that that facial displays can also be used to provide information such as disbelief or a surprise reaction of the listener (Ekman, 1979).

Facial displays can also work in conjunction with other communicative behaviours to provide information. For example, facial actions and displays in social interactions may function to reduce ambiguity in spoken language. As Schefflen (1968) suggested, information carried in stress patterns, tone of voice, and kinesic behaviours can contribute to a more precise message. Schefflen saw this as being accomplished in two ways: (1) by illustrating or adding information, and (2) by metacommunication, that is, communication about how a message should be taken. The first way facial displays can be used in conversations is similar to the illustrator category of facial displays proposed by Ekman and Friesen (1969b), which consisted of displays that co-occur with speech (e.g., batons, underliners, kinetographs, pictographs, etc.). Smiling when you are only joking

and do not want your listener to take your message seriously is an example of a facial display that serves as a metacommunication.

A second assumption underlying this research is that facial displays are primarily social. That is, they occur for the purposes of communicating information to others. This means that their occurrence is regulated more by the social situation than by underlying emotion processes. Traditional research on facial expressions has acknowledged a social influence on displays but it is regarded as a secondary influence which moderates the occurrence of displays. In their view, facial expressions are elicited either directly by emotionally arousing stimuli outside the individual or indirectly through internal emotion processes (e.g., physiological arousal, neurophysiological system) set off by external stimuli. (Cognitive processes may also set off an emotion.) The main point is that facial expressions are seen as a result of some emotionally arousing stimuli, rather than as a display that occurs as part of communication. In contrast, the premise here is that facial displays are primarily communicative and therefore their occurrence will be dependent on the social context. Specifically, it is necessary that there be another person present who will see the display; if there is no one to see the display, the probability of the display's occurring will decrease dramatically.

The occurrence of facial displays that convey emotional information may further depend on whether that information is appropriate to the interaction. If it is not appropriate to convey the information, then a communication theorist would probably agree

with the emotion theorist that the facial expression of emotion will be inhibited in the presence of others (e.g., for expressions of pain, see Kleck, Vaughan, Cartwright-Smith, Vaughan, Colby, & Lanzetta, 1976). Just as we select what to convey verbally, we can also select whether specific emotional information should be conveyed.

However, in many situations, the information is appropriate to the interaction, and in these cases a communicative theory would predict that facial displays (emotion or otherwise) will occur with greater frequency when there is another person visually present to receive that information.

In summary, there have been a number of theories proposed by researchers from a variety of fields. Basically they can be divided into two groups: theories that emphasize facial expressions as indicators or signs of emotion and theories that emphasize facial expressions as signals of information that are sent within social interactions. The theory underlying this proposal is consistent with the second group: facial displays that occur in social interactions are primarily communicative and are dependent on the availability of a receiver. These displays are also hypothesized to function alone or in conjunction with other verbal and nonverbal behaviours to produce communication between individuals.

CHAPTER 3

EXPLORATION OF FACIAL DISPLAYS IN CONVERSATION

Facial Displays as a Source of Non-emotion Information

It is apparent in the facial expression literature that there has been a bias towards studying facial expressions of emotion, and exploration of other kinds of information displayed by the face has received little attention. Indeed, given the number of studies on facial expression of emotion

it is tempting to regard the facial-expressive apparatus as simply a "dedicated system" specialized for facial displays of emotion. However, it is just as much as a "paralinguistic" display system (Fridlund, Ekman, & Oster, 1987, p. 145).

Fridlund and Gilbert (1985) proposed that the primary role of facial display is to provide information that adds to the verbal component of communication, rather than to provide emotion information.

Fortunately there have been some attempts to study communicative functions of facial displays. One approach has been to develop categorical systems that differentiate among the functions served by various nonverbal actions (including facial displays).

Categories of Nonverbal Acts

Ekman and Friesen (1969b) attempted to categorize various nonverbal acts (including facial expressions) based on the particular use(s) of the act, its origins, and the coding of the act, (that is, how meaning is contained in the act e.g., arbitrarily or iconically, extrinsically or intrinsically). In addition, Ekman and Friesen also examined the relationship between the nonverbal act and the words that

co-occur (or whether the nonverbal act was independent of words), the meaning conveyed by the act, and who was performing the nonverbal act (speaker or listener). Nonverbal behaviour was defined as "any movement or position of the face and/or body" (p. 49).

Based on Efron's (1941) work on gestures, Ekman and Friesen proposed five main types of nonverbal acts that involve mainly gestures and facial actions:

1. Emblems which are symbolic nonverbal acts such as the wink. Of all the facial and body movements, emblems are seen as being the most language-like. Fridlund (in press) described facial emblems as being "sentences imparted using the face... such as the conversational smile may say, for example, "I agree with you" or "I recognize what you're talking about" (p. 91). The meaning of an emblem is believed to be fairly precise (an emblem is like a word in that it has a limited number of alternative meanings) however, the exact meaning depends to some extent on the context in which the emblem is performed. Emblems are used in situations where speaking is not possible (e.g., a noisy area) as well as in conversations. Ekman (1977) noted that when an emblem is used in a conversation, it may replace a word, repeat the word(s) said, comment on, or qualify what is being said. If the emblem is repeating the word, it may occur before, during, or after the word is said.

Emblems are also used by the listener as responses to what was said by the speaker. Placement of emblems such as head nods and vocal responses ("mm-hmm") have been found to be related to pauses and "whether the juncture at the end of the phonemic clause is rising or

falling" (Ekman, 1977, p. 41).

Ekman and Friesen (1969b) distinguished emblems from other nonverbal actions because emblems are deliberate, voluntary, and "employed specifically for the purpose of communicating" (p. 45). They argued that people are aware of using emblems and take communicational responsibility for them, that is, they acknowledge using emblems to communicate information (whereas they may not be aware of using other kinds of nonverbal behaviours for the purpose of communicating).

An example of a facial emblem is the facial "shrug" (Ekman, 1985). The facial "shrug" involves "raising the eyebrows and dropping the upper eyelid, and making a horseshoe-shaped mouth" (p. 102). Its meaning is similar to that of a shoulder shrug (i.e., "I don't know").

2. Illustrators are nonverbal movements that accent or emphasize speech. They are closely tied to the ongoing speech and flow of the talk (they co-occur with speech) and serve to illustrate what is being said. Ekman and Friesen (1969b) pointed out that, unlike emblems, illustrators have no standard movement pattern. They also differ from emblems in that they may have no meaning independent of the words that occur with the nonverbal actions. The meaning of the illustrator is often so vague that it cannot be decoded when viewed away from its verbal counterpart.

Using Efron's terminology, Ekman and Friesen grouped six types of nonverbal behaviours within the category of illustrators: (1) batons, movements that "beat out", accent, or emphasize a particular word or phrase; (2) ideographs, movements that sketch a path or direction of

thought or trace "the itinerary of a logical journey" (p. 68); (3) diectic movements, which point to an object that is present; (4) spatial movements, which depict a spatial relationship; (5) kinetographs, movements that depict a bodily action; and (6) pictographs, movements that draw a picture of the referent. Emblems and facial affect displays (see below) can also be used as illustrators.

Ekman (1977) suggested that facial actions can function easily as batons or underliners, possibly but rarely as kinetographs, or rhythm illustrators, and probably never as pictographs. Ekman (1977) and Ekman and Friesen (1969) found that eyebrow movements are commonly used to emphasize words or a phrase in speech. Upper eyelid movements can also provide emphasis to speech (Ekman, 1985).

Ekman (1977) proposed five functions of illustrators. One function is when the person cannot find a word. In this case, the illustrator lets the other person know that the speaker cannot find the word that he or she wants and has not given up his or her turn. A second function is that illustrators can serve as self-primers, that is, they can help the person to find the word he or she is looking for. A third function is that they help the person to explain a topic, such as movement, which is difficult to explain in words alone. A fourth function is to punctuate speech, for example, by adding emphasis, tracing the flow of thought, or marking off clauses. This function is believed to help the listener process and understand what is being said. A fifth function offered (though it is not really a "function") is that illustrators increase when the speaker is excited

and involved in what is being said.

3. Regulators are nonverbal acts that regulate the flow of conversations. These are signals made by the listener that serve to manage the exchange of turns between the speaker and listener. They provide information to the speaker about what to do, for example, "to continue, repeat, elaborate, hurry up, become more interesting, less salacious, give the other a chance to talk" (Ekman & Friesen, 1969b, p. 82). The most common regulators are the head nod, eye contact, verbal "mm-hmm", and eyebrow raises. Regulators can also be performed by the speaker and tell the listener that the speaker would like him or her to pay close attention to what is being said, or that speaker has not finished his or her turn. Ekman and Friesen suggested that most regulators carry no message content in themselves (i.e., nothing related to the meaning conveyed verbally) but rather convey meaning about the structure and pacing of the conversation. Examples of facial regulators are smiles as back-channel responses (Brunner, 1979), and emblems for exclamation, questioning, and disbelief (Ekman, 1977).

Both illustrators and regulators are closely tied to the ongoing speech. Ekman and Friesen (1969b) pointed out that they differ from each other in that illustrators are related to the verbal content on a moment-to-moment basis, that is, they are tied to content, inflection, etc., whereas regulators are tied to the conversational flow or pacing of the exchange. They also differ in that illustrators carry meaning related to the content whereas regulators carry information related to the structure of the conversation.

4. A fourth type of nonverbal act is the self-adaptor or self-manipulator. These are movements which appear to be non-instrumental actions that serve no intentional communicative purpose (as emblems appear to do) and do not appear to be tied in any systematic way to the conversation (as illustrators and regulators are). Ekman and Friesen (1969b) proposed that these movements were originally

part of some adaptive effort to satisfy a bodily need, to manage emotions, to develop or maintain prototypic interpersonal contacts, or to learn instrumental activities. When the adaptor appears in the adult it is because something in the current environment triggers this habit; something has occurred currently which is relevant to the drive, emotion, relationship or setting originally associated with the learning of the adaptive pattern. (p. 85)

Examples of self-adaptors include movements such as scratching, grooming, lip sucking, lip biting, and wiping the lips with the tongue (Ekman, 1978). While adaptors are believed to have no intentional communicative value, they are thought to have both shared as well as idiosyncratic meaning. Shared meaning may consist of attitudinal information or indications of discomfort, etc. Idiosyncratic meaning may consist of information about the stimulus that originally triggered the adaptor or the history of how the adaptor was learned.

5. Ekman and Friesen (1969b) included expressions of emotion as the fifth type of nonverbal act. They noted that the face is the primary site of emotional information. Body movements that occur were seen as behavioural responses to the affect rather than displays of

affect. Based on the previous research, including the cross-cultural studies, Ekman and Friesen include the primary affect displays of happiness, anger, sadness, disgust, fear, surprise, and interest in this category. These facial expressions are seen as universal, and differences among cultures are explained by differences in stimuli that evoke these expressions, display rules, and behavioural consequences. Display rules regulate whether or not an emotion will be displayed on the face. Display rules are socially learned rules that "prescribe different procedures for the management of affect displays in various settings" (p. 75). Four different display rules were proposed: (1) de-intensify the display of affect; (2) over-intensify or exaggerate the display; (3) appear neutral, show no affect on the face; and (4) cover the felt affect by displaying another affect on the face (e.g., look happy when feeling sad).

In addition, Ekman and Friesen proposed that affect expressions are related to the verbal content in three different ways: (1) affect expressions can be totally unrelated to the words; (2) they can contradict, repeat, or qualify a verbally stated affect; and (3) they can serve as emblems (display of affect that is not occurring at the time). "The face can signal the emotion message in such a way that the observer knows the emotion is being referred to but not experienced" (Ekman & Friesen, 1977, p.44). Emotion emblems are believed to differ from facial expressions of emotion in their components (emblems will not include all the components) and in the timing of the movements (onset and offset of movements may be sooner or delayed in emblems). Emblems have also been found to be

asymmetrical whereas emotional expressions are symmetrical (Ekman, Hager, & Friesen, 1981). This is thought to be due to differences in the neurological components involved in the two kinds of facial action.

Ekman and Friesen (1969b) were the first to organize and categorize the various types of facial and gestural actions. Another system proposed by Scherer (1970) organized nonverbal signs according to their function in conversation. Scherer distinguished functions of nonverbal signs according to the dimensions of sign usage proposed by Morris (1955): semantic (relationship between sign and referent), syntactic (relationship between signs), pragmatic (relationship between sign and user), and dialogic (relationship between sign and interacting sign users as a system). According to Scherer, "nonverbal signs function semantically when they signify a referent by themselves or when they affect the meaning of co-occurring verbal signs" (p. 229). Semantic functions include nonverbal signs that either signify or substitute for verbal signs. This category would include nonverbal signs such as Ekman and Friesen's (1969) emblems. Nonverbal signs such as illustrators which illustrate, emphasize, or clarify the meaning of verbal utterances are also included in this group. Nonverbal signs can also function syntactically, that is, "they can regulate the simultaneous and sequential occurrence and organization of verbal signs and other nonverbal signs" (p. 229). Syntactic functions include segmentation of discourse into units (e.g., Scheflen's breakdown of discourse into presentation, positions, and points) and synchronization of verbal and nonverbal signs. They are

thought to possibly facilitate the speaker's organization of discourse and the listener's decoding of discourse. "Nonverbal signs function pragmatically by indicating characteristics or states of the sign users ..." (p.229). Pragmatic functions include the use of facial expressions for the expression of emotion as well as the use of nonverbal signs to indicate receiver reactions—listener feedback to the utterances of the speaker. Scherer proposed three types of listener feedback that are conveyed through nonverbal signs: (1) attention, (2) comprehension, and (3) evaluation of speaker utterances. Finally, nonverbal signs can "function dialogically by regulating the flow of conversation and by indicating the nature of the relationship between interaction partners in conversation" (p. 229). Dialogic functions include signs that help to structure the conversation in terms of the overall organization, for example, beginning and ending of conversations, changes in topic, tolerance of silences, and turn-taking. This category also includes nonverbal signs that indicate the nature of the relationship between the interactants.

In summary, two typologies for describing communicative functions of nonverbal actions have been proposed. Both were designed for the general class of nonverbal behaviours rather than facial displays. Ekman and Friesen's system is based on the origin, coding, and uses of the behaviour as well as its relationship to the verbal content. Scherer's system is based on the theoretical dimensions of sign usage (semantic, syntactic, and pragmatic) proposed by Morris (1955) but also includes a fourth category of dialogic functions. Neither system

however, was designed for examining the linguistic functions of facial displays although both contain categories that are concerned with linguistic functions. Other research has taken a different direction and rather than attempting to develop categorical systems, these studies have attempted to investigate social and conversational functions of a particular kind of facial action. Three kinds of facial actions have been studied: smiles, tongue show display, and eyebrow movements.

Smiles

One area of the face that has received attention as a conversational signal is the mouth or more specifically, the smile. The major muscle involved in smiling is the zygomatic muscle. This muscle extends from the cheekbone down and across the face and is attached to the corners of the lips. Muscle movement results in the lip corners being pulled upwards at an angle towards the cheekbones. "With strong action, the muscle also stretches the lips, pulls the cheeks upwards, bags the skin below the eyes, and produces crows feet wrinkles beyond the eye corner" (Ekman, 1985, p. 150). Ekman (1985) discussed 18 different kinds of smiles, two of which he believed served conversational functions. He distinguished among these 18 kinds based on what information was being displayed by the smile or the use of the smile in social interaction. The "felt" smile was a smile shown when genuine positive emotion was being experienced. Both the "fear" and "contempt" smiles were seen as actions that are mistaken for smiles. The "dampened" smile occurs when a person experiences a positive emotion "but attempts to appear as if those

feelings are less intense than they actually are" (p. 153). The "miserable" smile is described as a facial comment that the person is miserable, but is willing to grin and bear it. Miserable smiles were first discussed by Ekman and Friesen (1982). Another kind of smile was the "embarrassment" smile. Along with this smile, the person's gaze is directed either downward or to the side. The "qualifier" smile is used to soften an otherwise unpleasant or critical message. "The lip corners are tightened and sometimes the lower lip is pushed up slightly for a moment" (p. 156). This smile is seen as deliberate and the onset is typically quite abrupt. The "compliance" smile is used to show that the person is accepting an unwanted situation or fate. In addition to the smile, the brow may also be raised and a sigh or shrug may also occur. Other kinds of emotion smiles noted were "blend smiles" — smiles that accompany a negative emotion when the person is enjoying the emotion (enjoyable-anger, enjoyable-contempt, enjoyable-sadness, enjoyable-fear, enjoyable-excitement, and enjoyable-surprise). Two other kinds of smiles discussed are the flirtatious smile and the "Charlie Chaplin" smile. (In addition, Ekman and Friesen (1982) have found there are also "false" smiles, smiles that are deliberately put on to show a positive emotion when is not being felt or to mask a negative emotion).

The last two types of smiles discussed by Ekman (1985) were conversational smiles: the coordination smile which regulates the exchange of conversation between the two interactants and the listener response smile which is used by the listener to let the speaker know he or she is being understood. He described the coordination smile as

a "polite cooperative smile that serves to smoothly show agreement, understanding, intention to perform or acknowledgement of another's performance" (p. 157). The listener response smile is a particular kind of coordination smile and is used to encourage the speaker to continue with what he or she is saying. It is seen as being equivalent to the "mm-hmm" or head nod ("back-channel" signals, Duncan, 1972).

Brunner (1979) has provided evidence that smiles can be used as listener back channel signals. (In Ekman's terms they would be seen as "listener response" smiles.) Back channels are interchanges that occur within a speaking turn that allow a listener to comment on what is being said without interrupting the speaker or claiming the speaking turn. These "comments" function to provide feedback to the speaker that the listener is attending to what the speaker is saying and that the message is being understood. They can also serve as comments about the listener's reaction to what is being said (e.g., agreement/disagreement). Brunner examined smiles of the listener in a two-person conversation and found them to be organized in way that paralleled other back channel signals.

They are both consistently preceded by the speaker's within-turn signal, they are both unaffected by the speaker's gesticulation, and they are both more loosely distributed than turn attempts with respect to segment boundaries. (p. 732)

This was taken as evidence that smiles could function as back channels.

Rosenfeld (1972) has argued, however, that smiles are not back

channels but rather are social integration signals. In a study designed to look at the relation between rate of smiling and amount of approval received, Rosenfeld found that smiling was not related to the amount of approval received but rather correlated with amount of smiling by the other member of the dyad. Further investigation revealed that when interviewers decreased the amount of smiling, the amount of the interviewee smiles also decreased. In summarizing the results of his studies, Rosenfeld stated:

thus our overall accumulation of both experimentally controlled and uncontrolled studies of dyads in social interaction indicated that smiles do not function in the same way as do nods and verbal recognitions. Smiles appeared to operate almost as ritualistic devices for immediately assessing social integration among participants. (1972, p. 432)

In addition, Rosenfeld found that smiles occurred more often as an accompaniment to the subject's speech, in contrast to nods and other back channels, which occurred typically at the junctures of the other person's speech.

In summary, Ekman (1985) has proposed that there are at least 18 different kinds of smiles. In addition, there is other evidence that smiles function to provide information about listener reactions and about the relationship between interactants.

Tongue Showing Display

An unusual facial action that has received some empirical attention is that of "tongue showing". Tongue showing consists of making the tongue visible between the lips. It can be brief or last

for a few seconds or even minutes (Smith, Chase, & Liebllich, 1974). Smith et al. suggested that the tongue show serves to provide "the message that the communicator is relatively unlikely to initiate or accept suitably social interactions or particular features of them" (p. 203). A number of observational studies were conducted involving both children and adults (in North American and Latin American cultures) as well as gorillas and other primate species. Tongue showing was found to occur in a number of different situations, in which the common thread appeared to be an unwillingness to interact. Children were found to tongue show during an involving activity where concentration was important and social interaction would disrupt the activity; when social interaction was not desired by the child; when the child was being reprimanded or engaging in some forbidden activity; and during interactions with strangers. Adults were also observed to tongue show during situations which consisted of an involving or difficult task; avoiding a second interaction while already engaged in a social interaction (e.g., being asked questions by a third party while talking on the phone); or trying to avoid a particular interaction. Message content of the tongue show display was hypothesized to be: "The communicator may avoid or behave hesistantly if required either to accept or initiate a social interaction" (p. 230).

Dolgin and Sabini (1982) devised an experiment to see what effect tongue showing has on observers, that is, whether tongue showing serves to dissuade observers from interacting with the person producing the display. The results demonstrated that subjects who saw

the experimenter tongue show took significantly longer to interrupt the experimenter (to ask for another test booklet) than subjects who saw an experimenter who did not tongue show (the experimenter was displaying an otherwise neutral attentive expression). Interestingly, when asked most of the subjects who had witnessed a tongue show display denied they saw it.

Eyebrow Movements

Ekman (1979) examined eyebrow movements that serve as conversational signals. Conversational signals are those involved in regulating the conversation and include those of the speaker as well as those of the listener. In addition, he found eyebrow movements were also involved in emblem displays. Ekman selected eyebrow actions because of all the facial actions, the eyebrows "are probably among the most frequent facial actions employed as conversational signals" (p. 183). Although eyebrow movements were his primary focus, other facial actions that serve as conversational signals were also noted.

Eyebrow actions were measured using elemental Action Units (AU) which are responsible for the changes in facial appearance (Ekman & Friesen, 1978). Action Units are products of muscle movements and can occur singly or combine together. Ekman (1979) proposed that seven Action Units were responsible for changes in the eyebrow region. Five eyebrow actions are involved in emotional expression and two eyebrow actions are involved in conversational signals. The two types of eyebrow movements used in conversational signals are (1) eyebrow raises in which typically both ends of the eyebrow are raised and (2) eyebrows lowered and drawn together.

Eyebrow raises consist of two elemental Action Units: AU 1 and AU 2. AU 1 consists of changes in the eyebrow due to contraction of the medial portion of the frontalis muscle. "The inner corner of the eyebrow is raised and the skin in the middle of the forehead is pulled up which may cause short wrinkles to appear or deepen in the centre of the forehead" (p. 173). AU 2 occurs when the lateral portion of the frontalis muscle contracts. "The outer corners of the eyebrow are raised and the skin in the lateral portions of the forehead is pulled up, which may cause short wrinkles to appear or deepen in the lateral portions of the forehead" (p. 173). Action Units 1 and 2 typically occur together but not always.

The other Action Unit involved in conversational signals is Action Unit 4. AU 4 is responsible for eyebrow lowering. This action is the result of the contraction of the corrugator, depressor glabella, and/or depressor supercilli muscles. The action results in "the eyebrows being pulled down and together. The skin between the brows is bunched, often wrinkling or deepening a wrinkle between the brows" (p. 173).

Speaker Conversational Signals

Speaker conversational signals consist of batons, underliners, punctuation marks, question marks, word searches, and signals that appear to act as clause markers.

Batons are facial actions that emphasize speech. These facial actions coincide with vocal stress of words. AU 1 and 2 (raising of the eyebrows) was the most commonly found baton facial action. Other facial actions noted were: AU 4 (eyebrows pulled down and drawn

together), upper eyelid raise, nose-wrinkling, and eye squinting. Ekman hypothesized that AU 4 (eyebrows pulled down and drawn together) was used as an emphasizer when the person was experiencing uncertainly, perplexity, doubt, or difficulty of some kind.

The second signal observed was the underliner, a movement that is used to emphasize some unit of speech that is longer than a word such as phrase or clause. Similar to the baton, the underliner occurs together with a number of speech changes that provide emphasis to spoken words, such as increased loudness and pauses between phrases. Again, Ekman found AU 1 and 2 (eyebrow raises) to be the most common underliners.

Eyebrow movements were also found to be employed as punctuation marks. For example, when describing a series of events, a person might punctuate each event by using eyebrow movements as a comma in between each event. Eyebrow movements may also be used at the end of a phonemic clause as a period or exclamation mark. A phonemic clause is defined as "a segment of speech averaging five words in length which includes stress and intonation patterns and is terminated by what is called a juncture" (Dittman & Llewellyn, 1967, p. 79). Ekman proposed that AU 1 and 2 (eyebrow raises) are used as an exclamation point when the talk was about something amazing or incredible. AU 4 (eyebrows lowered and drawn together) was used as an exclamation point when the content of the talk involved seriousness, importance, doubt, perplexity, or difficulty.

Ekman (1979) pointed out that a number of theorists and researchers have found the use of eyebrow raises as a question mark.

Both AU 1 and 2 (eyebrow raise) and AU 4 (eyebrows lowered and drawn together) appear to be used more often when there is no verbal or syntactic indication of questioning, that is, when the structure of the utterance does not take the syntactic form of a question. AU 4 was believed to be used when the person asking the question is uncertain about the answer to the question.

AU 4 (eyebrow lowering and drawn together) was also found to be used as an illustrator when the person was searching for a word. Ekman noted it often co-occurred with filled word search pauses (e.g., ah, uh). AU 1 and 2 along with eyes looking up was also observed when the person was searching for a word. In addition to indicating that the person is searching for a word, Ekman proposed that the facial actions may also serve to hold the speaker's turn.

Although Ekman did not find any examples of eyebrow movements that function as clause markers, he reported an unpublished study by Liddell (1978) in which deaf people using American Sign Language were found to use eyebrow movements to mark relative clauses.

Listener Conversational Signals

The listener can also provide a variety of different responses through eyebrow movements. Listener agreement responses consist of AU 1 and 2 with a smile, head-nod, or agreement word, e.g., mm-hmm, and indicate that the listener agrees and is following what the speaker is saying.

AU 4 (eyebrow lowering and drawn together) is used as a request for more information when the listener does not understand or is not comprehending what the speaker is saying. This movement has also been

found to occur when the listener finds what has been said to be figuratively rather than literally incomprehensible (e.g., "I cannot understand why someone would do something like that, it just does not make any sense"). AU 1 and 2 (eyebrow raises) may also be used to indicate that the listener does not understand or metaphorically it may signal to the speaker the listener's incredulity in reaction to what the speaker has said (e.g., "I cannot believe you just said that").

Other movements observed were mouth movements by the listeners that appeared to emphasize the speaker's words. However, Ekman thought these movements occurred infrequently and only between intimate conversants.

Emblems

As noted previously, facial emblems can occur within conversations or by themselves. These messages often occur with other facial actions, head movements, gaze direction, or vocalization. Ekman gave the "wink" as an example of a facial emblem. Another emblem is the "flash", repeated eyebrow raises that occur along with an upwards tilt of the head, smile and upper eyelid raise. This emblem has been noted to be part of the greeting signal in some cultures (Eibl-Eibesfeldt, 1972). Another emblem that has been observed is the facial signal of disbelief or incredulousness. This signal involves AU 1 and 2 (eyebrow raises), "pulling the corners of the lips down (triangularis), relaxing the upper eyelid, pushing up the lower lip (mentalis), raising the upper lip, and /or rocking the head from side to side" (Ekman, 1979, p. 188). Another emblem

discussed is the facial signal of mock astonishment which involves AU 1 and 2 along with raised upper eyelids, dropped open jaw, and an exaggerated element to the performance. It is believed to differ from "true" astonishment in that it has a more abrupt onset and longer duration than actual astonishment.

In summary, there have been two attempts to categorize nonverbal actions according to their communicative functions. However, neither attempt has developed any kind of formalized coding system or established reliability of their coding system. In addition to these systems, three kinds of facial action have been examined—smiles, tongue showing, and eyebrow movements. These actions have been shown to display various kinds of information. However, this handful of studies is limited in the range of facial actions that have been explored and in the kinds of information that may be conveyed through the particular kind of facial display. Ekman's (1979) work on eyebrow movements and his (1985) work and Brunner's (1979) work on smiles has provided some initial data in this area, however, their work has provided us with only a starting point. Given the limited amount of previous research, the best approach to studying linguistic functions of facial displays appeared to be an inductive one; to begin by first obtaining a sample of facial displays that could be carefully examined. Possible linguistic functions could be revealed by noting various characteristics of the display such as the role of the person making the display (speaker or listener), where the display occurred in the stream of interaction (e.g., with words conveying some of the same information or at the end of utterances), and the message that the

display seemed to be conveying. It was hypothesized that careful examination of the displays in the interactive context in which they occurred would reveal the linguistic function served by those displays, that is, the kinds of information conveyed by facial displays in conversation.

Study 1

Method

Subjects

Twenty-eight subjects (14 women and 14 men) participated in this study. Their ages ranged from approximately 18 to 65 years, although most subjects were in their early twenties. All subjects were University of Victoria undergraduates who were recruited through the Psychology Department Volunteer Subject Pool. This study was embedded in a larger study and the dyads were run when only two people arrived for the study. The subjects formed 14 dyads, two of which were not analyzable because the participants' faces were obscured. This left four female dyads, four male dyads, and four male/female dyads.

Topics

The tasks used in this study were designed to elicit facial displays which might occur in everyday conversations. The tasks consisted of talking about three topics:

1. Nutritional Meal. Participants were asked to plan a nutritional meal consisting of foods that they disliked. One purpose of this topic was to elicit spontaneous displays of "disgust".
2. Minor-Conflict. Participants were asked to retell a conversation that involved a minor conflict between themselves and another person. One purpose of this topic was to elicit the use of facial displays indicating the "speaker role" in retelling the conversation. The minor-conflict topic was also chosen with the purpose of eliciting displays of past anger or irritation.
3. Close-Call Experience. Participants were asked to tell about

a close call or "near miss" situation that they had experienced or had heard about. The purpose of this topic was to elicit re-enactments of past emotion by the speaker and "empathic" displays of understanding on the part of the listener (for example, wincing in response to hearing about a situation in which the other person got hurt).

Procedure

Each potential participant was asked on the telephone if he or she would be willing to participate in a study on conversations. The researcher explained to the person that he or she would be joining another person, whom he or she did not know, and having a conversation about various topics. The person was also told that the conversation would be videotaped so that the investigator could have a record of the conversation. The researcher further explained that the participant would be able to see the videotape afterwards and receive a full explanation regarding the purpose of the study. If the person agreed, a time was arranged for him or her to come to the lab.

The study was conducted at the Human Interaction Lab of the Psychology department at the University of Victoria. When the two participants arrived for the study, they were told again that the researcher was interested in studying communication, that the conversation would be videotaped, and that they would see the tape afterwards. (See Appendix A for transcript of actual instructions.) The experimenter explained that they would be having a conversation about a number of different topics but that first they were to have a "get acquainted" conversation. The participants were told they should try to get to know each a little bit and they could talk about

anything they wanted. The experimenter explained that she would leave the room while they were talking and would return in approximately five minutes time. The experimenter then asked if there were any questions, answered them, and left the participants to get acquainted.

After about five minutes, the experimenter re-entered the room. She explained to the participants that they would be given three different topics to talk about and they would have about five minutes for each topic. She then went on to explain each of the topics. For the first topic they were told to plan a nutritional meal together, using only foods that they very much disliked. The second topic was for each participant to retell a conversation he or she had had with someone that had involved a minor conflict. The experimenter stressed that the participants were not to talk about any major conflicts they have had but rather something like, for example, a minor argument with their roommate. They should retell the conversation that they had with that person. For the third topic each was to tell each other about a "near miss" or "close call" experience that he or she had had. The experimenter explained that the example should be one in which "nothing bad really did happen but rather a situation in which the participant came close to having something bad happen, but at the last minute everything turned out all right".

After the three topics had been explained the experimenter told the participants that, if they wanted, they could change the order of the topics and they could take some time to think about what they were going to talk about before discussing the topics. The experimenter then asked if there were any questions and answered them. Before

leaving the room, the experimenter gave the participants a sheet of paper with the list of topics. It was hoped that, by explaining all of the topics beforehand and leaving a list, the conversation would be more natural than if the experimenter went back into the room after each topic had been discussed.

When the participants had finished their conversation, the experimenter came back into the room and asked them to come into the control room, where they viewed the videotape and received a full explanation of the study. After they had watched the videotape they were asked to sign a permission form on the use of the videotape for analysis (see Appendix B).

Scoring System

A scoring system had to be developed that would reflect the level of description appropriate for the research issue being studied here. A review of previous facial expression scoring systems revealed that there have been no previous attempts to devise a scoring system based on linguistic functions of the displays. Although a number of investigators have examined facial expressions on the basis of what information the display conveyed, this information has been limited to the type of emotion that is being displayed (for a review of measurement techniques, see Ekman, 1982). Moreover, most facial measurement systems are anatomically based (e.g., Ekman and Friesen's (1978) Facial Actions Coding System) or physiologically based (e.g., EMG recordings) and thus were unsuitable even for adaptation in the present study. What was needed was a system based on the informative function of the display, rather than a physical description.

Although no functional scoring systems could be found, there have been suggestions in the literature about possible non-emotion functions of facial displays. Syntactic functions of facial displays have been observed by Grant (1969) and Ekman (1982; 1979), although this was limited to eyebrow actions. Scherer (1980) proposed in general terms, that nonverbal behaviours can be differentiated on the basis of whether they serve syntactic, semantic, pragmatic, and dialogic functions but he did not go on to develop such scoring systems. Rosenfeld's (1987) and Brunner's (1979) research on listener responses demonstrated that important backchannel or listener responses can be conveyed via facial displays. Ekman and Friesen (1969b) and Scherer (1980) have distinguished between nonverbal behaviours that convey meaning independently of the words and nonverbal behaviours that illustrate the verbal content; this suggests that some displays do work closely with words and may therefore have linguistic functions. Finally, Ekman has also identified displays that have no informational value, that is, they are behaviours performed in the service of some bodily need or habit (Ekman, 1977; Ekman & Friesen, 1977; 1969b). This is useful for indentifying displays that should, for the present purposes, be excluded.

A System Based on Linguistic Functions

Selection of Facial Displays. For the purposes of this study a facial display was defined as movement or change in one or more areas of the face (i.e., brows, eyes, nose, mouth). Facial displays selected typically consisted of one or more actions such as eyebrow raising or lowering, eyes widening or squinting, nose wrinkling, upper

lip raises, mouth corners pulled back or down, etc. Displays could be symmetrical or asymmetrical. Movement that was due to blinking, swallowing, inhaling, laughing, or talking was not considered a facial display. However, actions such as wiping the lips with the tongue or biting the upper or lower lip were considered facial displays of interest.

Smiles were not included in the facial displays that were scored, for the following reasons: First, there has already been considerable research demonstrating that smiles can serve a number of different functions and that they convey different kinds of information (Ekman, 1985; Ekman & Friesen, 1972; Brunner, 1979; Rosenfeld, 1972). The focus in the present study was on facial displays that have not received much attention as to their function in conversations. Second, it appeared that smiles are difficult to score reliably. Ekman (1985) discussed 18 different kinds of smiles. Bugental (1986) reported interjudge agreement of .56 for onset of smiles. Mullett (1986) found that it was not possible to reliably determine offsets of smiles. Third, the sheer number of smiles observed in the conversations would have dramatically increased the amount of time needed to score all the displays.

When a facial display of interest occurred, the time it occurred was recorded along with who was making the display (the speaker or the listener). A general description of the actions that made up the display (e.g., eyebrows raised) was then recorded. A transcript was made of the verbal content surrounding the display, including where the display occurred in relation to what was being said (i.e., what

word the display began and ended with). A verbal "translation" of the display as was generated, for example, as if saying "I don't know".

After the above information had been gathered, the facial display was judged as to its general and specific function. These decisions were based on (a) what the display looked like (actions involved and general configuration of the face), (b) the context of the display, that is, what was happening in the conversation when it occurred (e.g., did it occur during a silent period or when the participants were interacting), and (c) what was being said at the time of the displays occurrence.

The above procedure was used by the author to discover the linguistic functions served by the displays that occurred in the sample of conversations. A data base was formed which consisted of the above information for every display observed. For example,

Time: 12:07

Dyad #: 12

Dyad Type: Male/Female

General Function: Syntactic

Specific Function: Question Marker

Facial Actions: Eyebrows raised

Context: Do you like fish?

----- (marks where the display
occurred)

Comments: (verbal translation of facial display)

These data led to a functional scoring system for classifying facial displays. General categories were established based on who

made the display (speaker or listener), the kind of information conveyed (syntactic, semantic, or nonlinguistic information), and whether the information was independent of (or redundant with) the verbal content. In addition, the display was also judged as to its specific function, that is, what specific information or message was conveyed by the display.

Reliability

After the system had been developed and applied to the entire data set, a second scorer was trained in order to assess reliability. This training was conducted in several phases of increasing difficulty. The first phase consisted of learning to identify the facial displays of interest. When the second scorer reached 90% agreement with the primary scorer on the occurrence of a facial display, she was then given further training as to how to score general and specific functions. First, the scorer was given written definitions and transcripts consisting of examples of the general and specific functions that had been found by the author. (See Appendix C for scoring instructions.) Following this, she watched a videotaped conversation while the author identified different types of facial displays. The scorer was then given two practice trials which involved identifying the general and specific functions of various facial displays without the help of the author (questions were allowed).

When the scorer had reached acceptable levels of agreement on the practice trials, she then scored 20% of the data (three dyads: one female/female, one male/female, and one male/female). For the

reliability trial, she was given a list of the times that a display had occurred, the list of all general and specific functions that might occur, and told to identify the general and specific functions for each display. The second scorer also had to provide some justification for her decisions. Justification typically involved transcribing the verbal content surrounding the display or providing a verbal translation of what the facial display appeared to mean.

The scoring system for the second scorer involved three decision stages: a decision that a display occurred, a decision as to the general function of the display, and a decision as to the specific function of the display. These three decisions were to some extent interdependent, that is, the decision about the specific function was not independent of the decision that a display occurred and the decision about the general function. This interdependence also affected the percentage of agreement between two scorers; percentage of agreement about the specific function included error due to the preceding decisions. In order to identify specific sources of error that occurred in the scoring process reliability was assessed in three steps: agreement that a facial display occurred, agreement about the general function, and agreement about the specific function.

Reliability for each decision stage was established by examining the percentage of agreement between the two scorers. As noted above, percentage of agreement that a facial display occurred was 90%. Percentage of agreement on the general categories was 96% overall (female/female dyad, 96%; male/female dyad, 94%; male/male dyad, 99%). Percentage of agreement on specific categories was 87% overall

(female/female, 81%; male/female dyad, 87%; male/male dyad, 95%). Percentage of agreement for specific categories when there was agreement on the general category was 91% overall (female/female, 84%; male/female, 94%; male/male, 98%). In total, there were five general categories scored and twenty-four specific categories scored. The probability of agreement by chance for the general categories is .2 and the probability of agreement by chance for the specific categories is .04.

Results

Description of Conversations

The average total length of the conversations was 11 minutes and 25 seconds. Mean time spent talking about each of the topics was: dinner planning, 4 minutes, 2 seconds; minor conflict situation, 3 minutes, 23 seconds; close call situation, 4 minutes. The female/female dyads talked for an average of 10 minutes and 29 seconds; the male/female dyads talked for an average of 10 minutes and 57 seconds; and the male/male dyads talked for an average of 12 minutes and 51 seconds.

Types of Facial Displays Found

In the following section the various types of facial displays that were observed are described in terms of who was giving the display (speaker or listener) and the type of information that the display appeared to be giving. Examples of each of the kinds of displays are also given. The square brackets [] indicate where the facial display occurred.

The different types of facial displays found can be organized

into five general categories based on the kind of information that was being displayed: syntactic displays, speaker comments, speaker illustrators, listener comments, and adaptors. Syntactic displays provide information to the listener about structural or grammatical aspects of the utterances or talk. They are therefore independent of the verbal content. Speaker comments, speaker illustrators, and listener comments all convey semantic meaning. Speaker comments and speaker illustrators differ in that speaker comments are displays that convey information that is in addition to what is being conveyed verbally, whereas speaker illustrators depict or represent what is being conveyed verbally. Listener comments are displays conveying semantic meaning that are produced by the listener while the speaker is talking. They convey, for the most part, information that is distinct from any meaning conveyed by the verbal content. Adaptors were displays that did not convey any linguistic information. In other words, they appeared to have no systematic relationship to the verbal content. The distribution of displays across the general categories are shown in Table 1.

As can be seen in Table 2, all categories are fairly evenly distributed across the three topics. One exception to this is Speaker Comment displays, which occurred slightly more often in the dinner planning discussion.

The frequencies of general category displays were also analyzed by type of dyad. Table 3 shows that the percentages are fairly evenly distributed across the three types of dyads with the exception of slightly more Listener Comment displays and Adaptors produced in the

Table 1

Distribution of Facial Displays Across General Categories.

Linguistic Categories		
Syntactic	27%	(315)
Speaker Illustrator	21%	(243)
Speaker Comment	14%	(162)
Listener Comment	14%	(160)
Nonlinguistic Categories		
Adaptor	25%	(301)
Not Assigned a Category	<1%	(3)
<hr/>		
Total		(1184)
<hr/>		

Note. Raw frequencies are in parentheses.

Table 2

Distribution of General Categories Across the Three Topics.

Category	Topic		
	Dinner	Conflict	Close Call
<hr/>			
Linguistic Categories			
Syntactic	32% (100)	27% (86)	41% (129)
Speaker Illustrator	39% (94)	31% (75)	30% (74)
Speaker Comment	48% (78)	24% (39)	28% (45)
Listener Comment	26% (41)	31% (50)	43% (69)
Nonlinguistic Categories			
Adaptor	32% (96)	35% (104)	34% (101)
<hr/>			

Note. Raw frequencies are in parentheses.

Table 3

Distribution of General Categories Across the Three Types of Dyads.

Category	Type of Dyad		
	Female/Female	Male/Male	Male/Female
<hr/>			
Linguistic Categories			
Syntactic	34% (106)	25% (80)	41% (129)
Speaker Illustrator	37% (89)	26% (64)	37% (90)
Speaker Comment	36% (59)	27% (44)	36% (59)
Listener Comment	50% (80)	24% (38)	26% (42)
Nonlinguistic Categories			
Adaptor	48% (143)	29% (88)	23% (70)
<hr/>			

Note. Raw frequencies are in parentheses.

female dyads. A high proportion of the adaptors were produced by one female in particular.

Syntactic Displays. Syntactic displays formed the largest category that was found (27% of the displays). These are facial displays that (1) mark stress on particular words or clauses, (2) are connected with syntactic aspects of an utterance or (3) are connected with the organizational structure of the talk (e.g., topics). Syntactic displays are independent of the verbal content. They do not appear to have any semantic meaning, that is, they are not used to convey meaningful content, but rather provide information about the main point that the speaker wants to make, syntactical aspects of the utterance, or where the speaker is in terms of the general organization of the talk (e.g., beginning new topic). Syntactic displays can be recognized by their placement in the utterance, or by their association with a particular type of utterance. The most common facial actions involved raising or lowering of the eyebrows. Sometimes the facial action consisted of widening or tightening around the eyes.

The frequencies of the specific kinds syntactic displays are given in Table 4. The highest percentage of syntactic facial displays found were connected to grammatical aspects of utterances. The most common was the emphasizer, a facial display that marks stress of a word. The facial display (often eyebrow movements) coincided with the word that was being stressed (often marked by intonation as well). For example

(1) "This is [really] silly as well."

Table 4

Distribution of Facial Displays Across the Specific Syntactic Categories.

Specific Category ^a	% of Total	
	Syntactic Displays	
Emphasizer	50%	(156)
Underliner	18%	(57)
Question Marker	14%	(45)
Offer	4%	(13)
Sentence Change	3%	(9)
End of Utterance	2%	(5)
Comma	<1%	(1)
Story Announcement	2%	(5)
Story Continuation	6%	(18)
End of story/topic	1%	(3)
Topic change	<1%	(1)
Pronunciation Correction	<1%	(1)
Self Correction	<1%	(1)

Note. Raw frequencies are in parentheses.

^aCategories are not ordered by frequency but are grouped according to similar functions which is the way they are discussed in the text.

- (2) "... and this other friend waiting in the car was just
[totally] P.O.ed."

It is interesting that if the idea to be stressed consisted of a noun described by an adjective, both words were marked by the facial display, for example,

- (3) "And the fellow that was coming around the corner behind me in a
[huge van] started to accelerate ..."

Longer units of speech, usually clauses, were also found to be marked by facial displays. Ekman (1979) called facial displays that accompanied these units of speech underliners. Examples of underliners are

- (4) "the wires [had become slightly bare]."
(5) "... he will turn left, [like if there's even if there's an
arrow or something]."

Question marker displays were also found. These facial displays either marked the grammatical form of a question or helped to indicate that a question is being asked, that is, that the utterance was to be taken as a question. Examples of a grammatical question marked by a facial display are

- (6) "[Do you like liver]?"
(7) "Have, [have you ever] kayaked?"

Examples of declarative sentences that were to be taken as questions are

- (8) "Well at least they got out, [he got out of it alright
though]?"
(9) "[You were probably going just a little bit fast]?"

The facial display may occur with part or all of the utterance and may depend on whether the question is a request for general or specific information. For example,

(10) "[Not any type of fish]?"

is a request for general information. As the brackets indicate, the facial display was held for the entire question. On the other hand,

(11) "[Blue] cheese?"

asks whether the other person is referring to blue cheese rather than cheese in general. In this case the facial display was held only for the adjective describing item.

Another type of facial display found is one that indicates sentence changes. Sentence changes occur when a person begins to say something, but then changes how he or she was going to express the idea and expresses it differently. For example,

(12) "... We put the we [leave] the choice up to the guests."

(13) "That mostly covers the [] fairly nutritious."

Facial displays can also act as commas. Although only one occurred in this sample, it occurred at a point in the utterance where there was a short pause before the person continued on.

(14) "... so we went out to dinner [] and um, you know, 'so how've you been?'"

The final type of display found within this group was one that appeared to signal the end of an utterance. It occurred either on the ending of the last word or immediately after the last word was said. The action typically involved raising of the eyebrows; sometimes only one brow was raised. Examples are

- (15) "... but there aren't any kind of fruits that are [awful]."
 (16) "Definitely nutritious, I'm sure []."

Another group of syntactic facial displays consisted of displays that appear to help structure the conversation. These displays served as markers of the beginning of a story/topic, the continuation of the story/topic, and the ending of a story/topic. Eyebrows actions were the most common markers observed. Facial displays would accompany the beginning or announcement of a story, for example,

- (17) "Um, [my dad], conflict with my dad."
 (18) "Okay, um, [driving], about maybe five years ago."

These opening statements were made as if the person were giving a title to the story they were going to tell.

Story continuation displays occurred with conjunctions such as "so", "but", "then", "so anyways", etc. They helped to indicate that the person was continuing on with his or her story. Examples of story continuation displays are

- (19) "... you just reach up and grab it and pull yourself around, [anyhow] um I was kayaking up ..."
 (20) "... like what else do you say to someone that you didn't know very well in high school [anyway and um] then we're just sitting having dinner ..."

Facial displays also marked the end of a story or of the topic, for example,

- (21) "... but that was the latest. [] Scary one."
 (22) "[Alright] so that would be the main course."

The utterances indicated that the person had finished telling the

story or that the participants had finished with that part of the task.

Two other types of displays were found, both were connected to speech corrections. Closing the eyes tightly was the action that made up the display. In one instance, the person had mispronounced a word and was attempting to correct it:

(23) "Ah, lets make it a brussel spout sp[sprout]."

In the second occurrence, the person had said the opposite of what he had intended to say:

(24) "Other kind of juices that may not be good for you, [I mean that are] good for you."

As can be seen in Table 5, most of the syntactic displays were fairly evenly distributed among the three topics. Slightly more question markers, offers, end of utterance, topic change, pronunciation and self corrections were found in the dinner planning discussion than in the other two topics. Story announcement and story continuation displays occurred more often in the close call topic, probably because this topic was more story-oriented than the other two topics. Finally the only comma display occurred in the minor conflict topic.

The frequencies of specific syntactic displays across the three types of dyads are reported in Table 6. End of story displays occurred more frequently in the female dyads' conversations than in the male or male/female dyads' conversations. Male dyads produced more story announcement displays than the other two types of dyads. Finally more question marker, offer, end of utterance, story

Table 5

Distribution of Specific Syntactic Displays Across the Three Topics.

Specific Category ^a	Topic		
	Dinner	Conflict	Close Call
Emphasizer	25% (39)	33% (51)	42% (66)
Underliner	14% (8)	32% (18)	54% (31)
Question Marker	62% (28)	11% (5)	27% (12)
Offer	100% (13)	—	—
Sentence Change	44% (4)	11% (1)	44% (4)
End of Utterance	60% (3)	20% (1)	20% (1)
Comma	—	100% (1)	—
Story Announcement	—	40% (2)	60% (3)
Story Continuation	6% (1)	33% (6)	61% (11)
End of story/topic	33% (1)	33% (1)	33% (1)
Topic Change	100% (1)	—	—
Pronunciation			
Correction	100% (1)	—	—
Self Correction	100% (1)	—	—

Note. Raw frequencies are in parentheses.

^aCategories are not ordered by frequency but are grouped according to similar functions which is the way they are discussed in the text.

Table 6

Distribution of Specific Syntactic Displays Across the Three Types of Dyads.

Specific Category ^a	Type of Dyad		
	Female/Female	Male/Male	Male/Female
Emphasizer	37% (57)	29% (46)	34% (53)
Underliner	32% (18)	26% (15)	42% (24)
Question Marker	29% (13)	16% (7)	56% (25)
Offer	15% (2)	23% (3)	62% (8)
Sentence Change	33% (3)	44% (4)	22% (2)
End of Utterance	20% (1)	—	80% (4)
Comma	100% (1)	—	—
Story Announcement	40% (2)	60% (3)	—
Story Continuation	33% (6)	6% (1)	61% (11)
End of story/topic	67% (2)	33% (1)	—
Topic Change	—	—	100% (1)
Pronunciation			
Correction	100% (1)	—	—
Self Correction	—	—	100% (1)

Note. Raw frequencies are in parentheses.

^aCategories are not ordered by frequency but are grouped according to similar functions which is the way they are discussed in the text.

continuation, topic change, and self correction displays were produced by the male/female dyads than the male or female dyads.

Speaker Illustrator Displays. Speaker illustrator displays formed the second largest linguistic category and accounted for 21% of the facial displays. Speaker illustrators are defined as facial displays that illustrate (form visual pictures of) the idea being verbally conveyed. The information being given by the displays is at least partly redundant with the information given by the verbal content. For example, a person might say "That's disgusting," while at the same time, displaying a disgust face. Although the facial display may at times be easily interpreted (i.e., stylized or "emblem-like"), other illustrative facial displays are more ambiguous. In these cases, they appear to be like Kendon's (1980) gesticulations or Ekman and Friesen's (1969b) illustrators; there is no recognizable form and cannot be understood without the accompanying words. It is the verbal content that provides the context for understanding how the displays should be interpreted.

Within this group, the displays were found to convey different kinds of semantic information. The frequencies of the specific kinds of speaker illustrators are reported in Table 7. Personal reaction displays illustrated verbal content that conveyed information about the speaker's reaction to something said in the conversation or to the task itself. They formed the largest group of speaker illustrators. These displays illustrated liking or disliking something; presented emotions such as disgust, surprise, excitement; gave opinions about the topic or something that was being discussed (e.g., "That was

Table 7

Distribution of Facial Displays Across the Specific Speaker
Illustrator Categories.

Specific Category ^a	% of Total	
	Speaker Illustrator Displays	
Personal Reaction	36%	(87)
Portrayal	34%	(83)
Thinking/Remembering	8%	(20)
Facial Shrug	7%	(17)
"Yes"	6%	(15)
"No"	2%	(4)
"Not"	3%	(7)
"But"	2%	(5)
Qualifier	1%	(3)
Clarification	<1%	(1)
Explanation	<1%	(1)

Note. Raw frequencies are in parentheses.

^aCategories are not ordered by frequency but are grouped according to similar functions which is the way they are discussed in the text.

stupid."); or indicated problems involved in doing the task itself, such as difficulty in doing the task (e.g., difficulty in coming up with a particular food or story). It is important to note that personal reaction displays were regarded as symbolic representations of the above information just as the words were and not necessarily tied to an ongoing emotional reaction. These displays were not limited to one particular facial action but rather could consist of one or more actions in different areas of the face depending on what was being conveyed. In example 25, speaker A illustrates that she is having difficulty in answering the question because she does not know the exact height. The facial display consisted of a quick eyebrow raise, then eyebrows lowered, then eyes looking up.

(25) "... B: How high up were you?" A: "[Um], I'm really not too sure."

In the next example, the speaker raises her eyebrows, raises her upper lip, and squints her eyes.

(26) " ... [I hate, I hate desserts with alcohol in them]."

Portrayal displays was the second largest group found within the general category of speaker illustrators. Portrayal displays are displays which (1) mark the re-enactment of a past conversation or (2) consist of a re-enactment of a display that occurred in the past (either the speaker's or someone else's). In the first case, the speaker would illustrate that he or she was going into the role of another person who was not present or that he or she was re-enacting something that he or she (the speaker) had said in the past. It is as if the speaker were putting quotation marks around the speech so that

the listener can understand that the utterance was one that had been said in past conversation. Typically these displays would consist of eyebrow actions, often raising of the eyebrows. Examples of marking conversation are:

(27) "... and I said [Is there any need to talk to me like that?]"

(28) "And I just said [Well it just shows how much you know about me and I just let it go] at that."

The second type of portrayal consisted of displays that re-enacted the way someone had looked in the past. These displays may illustrate past emotion displays but could also be re-enactments of how they looked while doing something, e.g, driving a van. An example of a display of past emotion is:

(29) "but I was like [errrrr]."

In the above example the facial action consisted of a tightening of the eyes. The display, along with the vocalization, illustrated that she had been angry at the time. In the next example the speaker was re-enacting a past event. He displayed an illustration of "looking cool" as he described how he tried to impress some children with his driving. The facial actions included eyes squinted, nose wrinkled, and head lowered and forward.

(30) "... on the road at all, [I was just looking at the kids gunning my engine] ..."

Thinking/remembering displays were another type within the speaker illustrator category. These displays were found with verbal content indicating that the speaker was thinking about something or recalling an event from memory. Searching for a word was another type

of a thinking display. These displays occurred with utterances containing filler words such as "um", "ah", etc. The facial display might involve raising or lowering of the eyebrows, closing the eyes or looking up and off to one side, or mouth actions such as pulling one side back or twisting the mouth to one side. Examples of thinking/remembering displays are:

(31) " ... the last disagreement I had was um[]with my mother actually."

(32) " You have little images from your ah [childhood]."

Another type of speaker illustrator found was the facial shrug. These displays illustrated expressions such as "I don't know", "Oh well", "Okay". (This "I don't know" differs from the personal reaction displays such as difficulty in remembering in that the words are usually said offhandedly or as an aside or filler, suggesting that the person does not literally mean that he or she does not know.) The facial shrug also occurred at points in the conversation when the person had conceded something in the discussion, was reacting with resignation about something, or had decided that what they had done was good enough. Ekman (1985) described facial shrugs as consisting of a number of facial actions. The category of facial shrug in the present study was not limited to this complex display but also included singular facial actions such as eyebrow flashes (sudden raising and then return of the eyebrows to their normal level), downward turning of mouth corners (forming a horseshoe shape), or a pulling back of one mouth corner.

Examples of facial shrugs are:

(33) "... and dessert, [good enough.]"

(34) " [I don't know], well I don't like snails no."

Displays were also found to mark "yes" and "no" responses made by the speaker. Usually these displays consisted of eyebrow actions:

(35) "[Yeah], that's true."

(36) "[No], we can go on to the next topic."

Another type of speaker illustrator marked abstract verbal negation ("not"). These displays sometimes consisted of eyebrow actions or closing the eyes.

(37) "[I don't have minor conflicts] with people."

(38) "... so I [couldn't] get around ..."

A related display marked the use of "but" in a statement.

(39) "Oh I do [but] that could be your contribution."

(40) "... spinach [but] you know, I sort of like spinach ..."

Qualifier words were also illustrated. Although only two such displays were found, they both consisted of eyebrow raises.

(41) "It's [probably] good ..."

(42) "I figure [probably] most close calls ..."

Two other types of speaker illustrators were found. Both consisted of lowering the eyebrows. One display marked a clarification of the reason for including certain foods in their dinner menu:

(43) "... liver I guess is good for you and ah and [I mean] (pause)
coconut's probably good for you ..."

The other marked the speaker's attempt to clarify an utterance that the listener did not understand:

(44) "A: What they serve in the cafeteria?" B: "[Yeah, like they usually have] pretty gross soups."

As can be seen in Table 8, personal reaction, facial shrug, "no", and "but" displays occurred more often in the dinner planning discussion than in the other two topics. The clarification and explanation displays occurred only in the dinner planning discussion. Portrayal displays were found more often in the minor conflict topic than in the other two topics. Displays illustrating "not" were found more often in the close call stories than in the other two topics.

The frequencies of the specific kinds of speaker illustrator displays produced by the different types of dyads are reported in Table 9. Slightly more portrayal, "yes", and "not" displays were produced by the female dyads than by the other two types of dyads. The clarification and explanation displays occurred only in the male dyads. Personal reaction, thinking/remembering, "no", and qualifier displays occurred more frequently in the male/female dyads than in the male or female dyads.

Speaker Comment Displays. The third major group of facial displays found were speaker comments which accounted for 14% of the facial displays. Speaker comment displays were displays that added additional information to the ongoing verbal content. Unlike speaker illustrators, this information is not redundant with what was said, that is, it does not illustrate or repeat the meaning conveyed by the verbal content. These displays usually accompanied words; although they also would at times occur on their own without anything being said; for example, neither person is speaking, and one person would

Table 8

Distribution of Specific Speaker Illustrator Displays Across the Three Topics.

Specific Category ^a	Topic		
	Dinner	Conflict	Close Call
Personal Reaction	63% (55)	13% (11)	24% (21)
Portrayal	4% (3)	63% (52)	34% (28)
Thinking/Remembering	40% (8)	30% (6)	30% (6)
Facial Shrug	65% (11)	6% (1)	29% (5)
"Yes"	47% (7)	7% (1)	47% (7)
"No"	50% (2)	25% (1)	25% (1)
"Not"	29% (2)	14% (1)	57% (4)
"But"	60% (3)	20% (1)	20% (1)
Qualifier	33% (1)	33% (1)	33% (1)
Clarification	100% (1)	—	—
Explanation	100% (1)	—	—

Note. Raw frequencies are in parentheses.

^aCategories are not ordered by frequency but are grouped according to similar functions which is the way they are discussed in the text.

Table 9

Distribution of Specific Speaker Illustrator Displays Across the Three
Types of Dyads.

Specific Category	Type of Dyad		
	Female/Female	Male/Male	Male/Female
Personal Reaction	36% (31)	20% (17)	45% (39)
Portrayal	46% (38)	34% (28)	20% (17)
Thinking/Remembering	20% (4)	25% (5)	55% (11)
Facial Shrug	29% (5)	29% (5)	41% (7)
"Yes"	40% (6)	13% (2)	47% (7)
"Not"	43% (3)	29% (2)	29% (2)
"No"	—	25% (1)	75% (3)
"But"	40% (2)	20% (1)	40% (2)
Qualifier	—	33% (1)	67% (2)
Clarification	—	100% (1)	—
Explanation	—	100% (1)	—

Note. Raw frequencies are in parentheses.

^aCategories are not ordered by frequency but are grouped according to similar functions which is the way they are discussed in the text.

look at the other and make a display as if to say, for example, "I don't know." or "Well, now what?"

The frequencies of the various specific speaker comment displays are reported in Table 10. Personal reaction displays accounted for most of the speaker comments found. These displays would accompany a speaker's utterance but added information about a reaction (e.g., dislike or disgust) or an opinion (like or dislike) about what was being discussed. Again, like speaker illustrators, the displays were viewed as symbolic representations of reactions or opinions and not necessarily the person's "real" feelings. The facial actions that made up the display would vary depending on the meaning being conveyed by the display. In the first example below the speaker lowers her eyebrows, and squints her eyes.

(45) "It's too [salty. It's it] I don't know."

In the next example the speaker squints her eyes and wrinkles her nose.

(46) "[Basic steamed white rice]."

Personal reaction displays also included displays that convey information about a reaction at the time of the conversation, such as difficulty in answering. In the following example speaker B raised her eyebrows before she began talking and held them up for the first two words.

(47) A: "Has it gone now?" B: "[It's go]ne down ..."

Thinking/remembering was the second largest sub-category found, almost as large as personal reaction displays. These displays usually consisted of eyebrow raising or lowering, mouth twisted to one side,

Table 10

Distribution of Facial Displays Across the Specific Speaker Comment Categories.

Specific Category	% of Total	
	Speaker Comment Displays	
Personal Reaction	45%	(73)
Thinking/Remembering	27%	(43)
Facial Shrug	19%	(31)
Interactive	4%	(7)
Metacommunicative	2%	(4)
Qualifier	< 1%	(1)
"Yes"	< 1%	(1)
Unclassified	1%	(2)

Note. Raw frequencies are in parentheses.

or one corner of the mouth pulled back. These displays sometimes occurred with words although often neither person would be saying anything, and one person would raise his or her eyebrows as if to say "I'm thinking." Examples of thinking/remembering displays found with verbal content are

(48) "[Well] no, that's true."

(49) "... for a few miles before you can get to the next [one]. Yeah and just across the lanes ..."

Facial shrugs were the third largest category found. These displays often occurred when no words were being spoken and seemed to convey ideas such as "I don't know", "What can I say?", "Too bad." The actions that made up the displays were the same ones that made up the speaker illustrator facial shrug category (eyebrow flashes, mouth corners pulled back, and corners of mouth pulled down into a horseshoe shape). These actions occurred separately or in some combination.

(50) A: "... I don't like cantalope." B: [].

In the above example, both eyebrows were raised, with the right brow raised slightly higher and B's eyes were turned slightly upward and to the right. The display appeared to convey the message "Yeah, I suppose so, I find them okay." In the next example, B's mouth is stretched out and pulled to one side (mouth twist).

(51) A: "What else?" B: [].

Facial shrugs would also occur at the end of an utterance. Typically the person would quickly raise and lower his or her eyebrows (eyebrow flash).

(52) "Soups, I like almost every soup []."

(53) "... it was coming to a boil there for awhile" [].

Another category was interactive displays. These displays occurred with the expression "You know?". The displays appear to attempt to include the listener in the interaction. They often consisted of eyebrow raises:

(54) "I was going to say spinach salad because [you know], how everyone ..."

(55) "Yeah just [you know], running across the street, walking across ..."

A small subset of speaker comment displays were the metacommunicative displays. Metacommunicative displays are ones that help the listener decide how the message should be taken, for example, whether the speaker is being sarcastic or is joking.

Metacommunicative displays were also found when the speaker was "playing" with an expression. However, sarcastic displays were the most common. For example, in one conversation, A has just finished summarizing their dinner which consisted of disliked foods. At the end B comments

(56) "[Mmmm]."

At the same time, B raises her eyebrows and also slightly raises her upper lip. In this case the sarcasm is communicated through the contradiction between saying something that would normally be said when one liked a food and her display which suggested slight disgust as well through the fact that B gave a positive utterance when it was clearly understood the foods were not appealing.

Another sarcastic display occurred in another conversation, in

which B was talking about her close call that had occurred in the same month (January) as A's. She begins with

(57) "Last January, [it was] a great month []."

B first raised her eyebrows and then looked up and off to the left.

The message that came through was "It was a bad month for both of us."

Facial displays were also used to convey "yes". This occurred only in one case. The facial actions consisted of lowering the eyebrows and squinting the eyes.

(58) A: "Say tacos for." B: " For" []. A: "For appetizer."

B: "Yeah."

Two displays were unclassified. In one case, the display appeared to convey the message "This will have to do."

(59) "... [but it's the only minor conflict I can think of]."

The other display occurred during a conversation in which B is describing driving on the highways in Toronto. A responds by saying that she has been to Toronto. B looks up and raises her eyebrows which seemed to convey the idea "You know what it's like then."

(60) "I've [lived there]."

As can be seen in Table 11, personal reaction, thinking/remembering, facial shrug, and "yes" displays occurred more often in the dinner planning discussion than in the other two topics. Qualifier displays occurred more often in the Minor Conflict topic than in the other two topics. More metacommunicative displays were found in the close call topic than the other two topics.

The frequencies of specific speaker comment displays across the three types of dyads are reported in Table 12. More personal

Table 11

Distribution of Specific Speaker Comment Displays Across the Three Topics.

Specific Category	Topic		
	Dinner	Conflict	Close Call
Personal Reaction	56% (41)	15% (11)	29% (21)
Thinking/Remembering	44% (19)	26% (11)	30% (13)
Facial Shrug	45% (14)	39% (12)	16% (5)
Interactive	29% (2)	29% (2)	43% (3)
Metacommunicative	25% (1)	25% (1)	50% (2)
Qualifier	—	100% (1)	—
"Yes"	100% (1)	—	—
Unclassified	—	50% (1)	50% (1)

Note. Raw frequencies are in parentheses.

Table 12

Distribution of Specific Speaker Comment Displays Across the Three
Types of Dyads.

Specific Category	Type of Dyad		
	Female/Female	Male/Male	Male/Female
Personal Reaction	45% (33)	29% (21)	26% (19)
Thinking/Remembering	30% (13)	19% (8)	51% (22)
Facial Shrug	26% (8)	35% (11)	39% (12)
Interactive	14% (1)	43% (3)	43% (3)
Metacommunicative	75% (3)	—	25% (1)
Qualifier	—	—	100% (1)
"Yes"	—	100% (1)	—
Unclassified	50% (1)	—	50% (1)

Note. Raw frequencies are in parentheses.

reaction, metacommunicative, displays were produced by the female dyads than the other two types of dyads. More "yes" displays were produced by the male dyads than the other two types of dyads. Thinking/remembering, interactive, and qualifier displays were produced more often by the male/female dyads than the male or female dyads.

Listener Comment Displays. The fourth general category was listener comments and accounted for 14% of the facial displays. Defining the listener in a conversation has always been a difficult challenge faced by conversation analysts. (For a review of this topic see Rosenfeld, 1987.) For the purposes of this study, a listener was defined as the recipient of talk, that is, the person who was not doing the speaking at the time. This meant that a participant was in the role of listener only when the other person was actually talking. (If neither person was speaking, then both were considered to be speakers.)

Listener comment displays were facial displays made by the person who is not talking at the time and were in response to the utterances made by the other person. In other words, one participant was considered to be a listener when the other person was doing the majority or all of the talking at the time the display occurred. A person was defined as a listener when he or she said nothing at all or gave a comment that had no substantial meaning to it, for example, "Oh really" or "That's interesting." If the person said any more than that, he or she was considered to be a speaker. Also, if the person had been addressed by the other (e.g., been asked a question) he or she was defined as a speaker while answering. Displays made by the

listener typically occurred while the speaker was still talking or at the end of the speaker's utterance.

The frequencies of specific listener comment displays are reported in Table 13. The largest group of displays found were back-channel responses. These are displays that let the speaker know that the listener is attending and is following what is being said. Sometimes the display accompanied a vocalization such as "uhuh", "mhm", "yeah", etc. Back-channel displays typically consisted of eyebrow raises, mouth corners turned down, eyes closed, or lips pressed. Examples of back-channel comments are

(61) A: "... wasn't a mark on my car." B: " [Oh]."

(62) "... a U-turn [to go into the parking lot] ..."

The second largest group found was personal reaction displays. This type of display can be distinguished from back channels in that they are a stronger comment on what had been said, that the listener was conveying something in response to what the speaker had said rather than just acknowledging the content. The facial display was often more stylized or exaggerated than back-channel displays. The actions that made up the displays involved various parts of the face, depending on the particular reaction displayed by the listener. Examples of personal reaction displays are:

(60) A: "Then it can sit." B: "[Ugghh]."

In the above example, B squinted her eyes and wrinkled her nose. The actions involved in the next example (61) were squinted eyes and a raising of the upper lip.

(61) B: "Thick slices of liver." A: "[Yeah]/oouu."

Table 13

Distribution of Facial Displays Across the Specific Listener Comment Categories.

Specific Category	% of Total	
	Listener Comment Displays	
Backchannel	53%	(84)
Personal Reaction	30%	(48)
Motor Mimicry	13%	(21)
Understanding	2%	(3)
"Yes"	2%	(3)
Agreement	< 1%	(1)

Note. Raw frequencies are in parentheses.

In another conversation, the listener indicated to the speaker that it was difficult to understand (metaphorically) what the speaker's roommate had done. It was as if the listener was nonverbally saying "Sounds strange." The facial action consisted of lowering the eyebrows:

(62) "... and he's making a pyramid [out of them]. Like ..."

The same listener displayed a reaction of amazement (eyebrows raised) at the fact that the speaker's roommate had never drunk alcohol before.

(63) " ... drank before he came to university. [He's in first year]..."

Probably the most interesting of all the listener reactions are the motor mimicry displays. These displays are ones made by the listener that illustrate a reaction to an event experienced in the past either by the speaker or by someone that the speaker is talking about. They were reactions that are made by the listener but are displays that could occur in the actual situation being described. They appear to function as messages that indicate an understanding of the situation being described. For example:

(64) A: "... and um I fell and I did like I did a double back flip."

B: "[Ooooo]."

The display consisted of B's eyebrows drawn together and down, eyes squinted, and an "O" shaped mouth with lips slightly parted and pushed forward. In the next example, B lowered his eyebrows and shut his eyes tightly.

(65) A: "... and I just got a big gulp of the Gorge ..."

B: "[Ahhhhhhhhh]."

It was also observed that the listener sometimes would anticipate what was going to be said, and as a result, the display would occur just as the speaker was describing the situation. In the example below, B's eyes are squinted and the corners of her mouth are pulled back and slightly up. Eyebrows are then raised up:

(66) B: "... grill of a van[and it crashed into the side] just the back panel of the car ..."

A much smaller group of displays occurred that were related to motor mimicry displays but seemed to indicate a more general understanding or appreciation of the situation rather than illustrating a reaction appropriate to the specific situation. These displays were less dramatic or stylized in their appearance and would consist of, for example, eyebrows raised and eyes closed.

(67) A: "... thinking I was never going to walk again."

B: [Nods].

In the above example, B appeared to be saying by her display "Gees that was close." In the next example, B's eyebrows were raised and her eyes were lowered:

(68) A: "...but hey, I'm still walking." B: [].

In this case B facially displayed a message that appeared to say "Yeah, you were lucky."

A small minority of displays were ones that conveyed "yes". These displays (consisting of eyebrow raises) usually accompanied a verbal "yes".

(69) "[Oh yeah]."

(70) "[Yep]."

Finally one display (eyebrow raise) was found to convey agreement:

(71) B: "... it's a bit of a trick to get yourself rolled."

A: "[Yeah] it is." B: "Over."

As can be seen in Table 14, more personal reaction and "yes" displays occurred in the dinner planning discussion than in the other two topics. Back-channel, motor mimicry, understanding, and agreement displays occurred more often in the close call stories than in the other two topics.

The frequencies of specific listener comment displays exhibited by the three types of dyads are reported in Table 15. The female dyads produced more backchannel, personal reaction, and motor mimicry displays than the other two types of dyads. Male/female dyads made more "yes" and agreement displays than the male and female dyads.

Adaptors. Adaptors accounted for 25% of the facial displays scored. The most common actions seen were around the mouth area such as wiping the lips with the tongue, biting one lip, pressing lips together. Other actions were a result of a behaviour such as scratching some part on the face or as a result of physiological discomfort (e.g., sore eyes).

Typically these displays have been thought of as having no meaningful semantic or other informational value and as occurring for other reasons (Ekman and Friesen 1969b)—possibly physiological need or habit. However, although this was not systematically examined in the present study, it did appear to the author that some adaptors may

Table 14

Distribution of Specific Listener Comment Displays Across the Three Topics.

Specific Category	Topic		
	Dinner	Conflict	Close Call
Backchannel	21% (18)	33% (28)	45% (38)
Personal Reaction	42% (20)	38% (18)	21% (10)
Motor Mimicry	5% (1)	19% (4)	76% (16)
Understanding	—	—	100% (3)
"Yes"	67% (2)	—	33% (1)
Agreement	—	—	100% (1)

Note. Raw frequencies are in parentheses.

Table 15

Distribution of Specific Listener Comment Displays Across the Three
Types of Dyads.

Specific Category	Type of Dyad		
	Female/Female	Male/Male	Male/Female
Backchannel	49% (41)	25% (21)	26% (22)
Personal Reaction	46% (22)	23% (11)	31% (15)
Motor Mimicry	67% (14)	24% (5)	10% (2)
Understanding	100% (3)	—	—
"Yes"	—	33% (1)	67% (2)
Agreement	—	—	100% (1)

Note. Raw frequencies are in parentheses.

serve as a back-channel response which indicates to the speaker that the listener is listening and will not interrupt. One specific display which was produced by the listeners in the conversations quite often was biting and holding the bottom lip between the teeth.

Additional Descriptive Statistics

There was a slight tendency for the female dyads to be slightly more expressive than the other two types of dyads. Female dyads produced 40% of the displays whereas the male dyads produced 27% of the displays, and the male/female dyads produced 33% of the displays that occurred.

Discussion

The purpose of this study was to discover inductively what kinds of linguistic functions are served by facial displays in conversation. Previous work on facial displays has, for the most part, concentrated of the use of facial displays to convey emotion. The only exception to this has been Ekman (1979), who examined syntactic functions of eyebrow movements. Until now there have been no further attempts to discover whether there are any other functions facial displays serve in conversation. The present study was an attempt to develop this relatively unknown area. By examining a number of characteristics of the context in which the display occurred and by "translating" the verbal message sent by the displays, a set of general and specific categories was generated that described virtually all of the facial displays seen. These categories were based partly on previous work by Ekman (1979), although most of the categories emerged from the data. The results suggest that the linguistic uses of facial displays are

much more varied than the previous literature would suggest and include both syntactic and semantic information. Syntactic information provided by displays helped to structure and organize the talk by emphasizing main points and by marking changes of topic. In this way syntactic displays by the speaker presumably facilitate understanding. Semantic information was conveyed by both speaker and listener displays. Facial displays were found to convey information about personal reactions (including emotion) as well as information such as re-enactments of prior behaviours, facial "comments", clarification, back channels, "thinking", etc. Metacommunicative information was also found to be conveyed facially, lending support to Scheflen's (1968) hypothesis that nonverbal displays may serve this function. Listener displays played particularly important role in communicating back-channel information as well as reactions to the speaker's utterances.

In total, 82% of the displays (excluding adaptors and displays not categorized) were associated with speaking. Listener displays were by definition minimally related to any verbal content. This finding supports the proposition that displays are more tied to language than they are to emotion. If displays are mainly used to convey emotion, then both speaker and listeners would be equally likely to exhibit them.

Within the group of speaker displays, facial displays were further differentiated on the basis of their relationship to the verbal content. Some speaker facial displays (speaker comments) conveyed information non-redundant with information given by the

verbal content, however, most of the speaker displays (speaker illustrators) conveyed information that was redundant with some of the information given in the verbal content.

It would also appear that the topics chosen were fairly successful in eliciting specific types of displays. The dinner planning topic produced more personal reaction displays than the did the other two topics. More portrayal displays were found in the minor conflict topic than in the other two topics. Finally, more motor mimicry displays were observed in the close call stories than in the other two topics.

CHAPTER 4

SOCIAL DETERMINANTS OF FACIAL DISPLAYS

Social Inhibition of Facial Displays

Although most theories and facial expression researchers acknowledge that facial expressions can be used in social situations, a number of psychological studies have focussed more on how facial expressions will be inhibited by others. Ekman and Friesen (1969a; 1969b) suggested that people are more likely to manage (i.e., alter, hide, or exaggerate) their expressions when in the presence of others. Since this hypothesis has been put forward there have been a number of studies conducted to learn more about how the presence of others will lead to the alteration, particularly masking or hiding, of displays. Ekman (1972) and Friesen (1972) found that the type of facial expression shown may differ depending on the culture and the relationship between the person displaying the expression and the receiver. After viewing a negatively emotionally arousing film, Japanese subjects masked their expressions with a smile when discussing the film whereas the American subjects displayed signs of negative affect when discussing the same film.

Kleck, Vaughan, Cartwright-Smith, Vaughan, Colby, and Lanzetta (1976) investigated the effect of an observer on subjects' expressions of pain. They found that subjects were less expressive when under observation than when they were alone. The investigators concluded that the experiments "were consistent with the notion that adults control their nonverbal displays [expression] of emotion in the presence of others" (p. 217). It could be argued, however, that being

observed from a one way mirror is a unique "social" situation and is qualitatively different from having someone else present in a room.

In both of the above studies, the display of emotion would probably have been embarrassing for the subjects and this may be one condition under which people will manage facial expressions of emotion. In addition, Buck (1984) has pointed out that

the others involved have been of different role and status in the situation compared to the subjects, and they have not shared the emotional stimulus with the subject. (p. 190)

He also suggested that it should be possible to set up situations "in which the presence of another would not interfere with spontaneous expressiveness" (p. 190). Consistent with this idea is a growing body of evidence that suggests certain kinds of facial expressions and displays are more likely to occur when people are interacting with others than when they are alone.

Social Elicitation of Facial Displays

Working from an ethological perspective, Kraut and Johnson (1979) set up four field studies to determine the relative importance of emotional and social factors in adult smiling. The emotional expression view proposes that smiling is caused by feelings of happiness and therefore a person will smile whenever he or she feels happy unless display rules operate to inhibit or mask the smile. The ethological approach proposes that human smiling serves the same functions as the chimpanzee's bared teeth display, specifically, to deflect hostility and maintain friendly contact. Hooff (1972) argued

that the smile is used to establish and maintain a friendly interaction. "The smile is an evolutionarily designed signal to smooth interactions among members of a species who must cooperate in group living" (Kraut & Johnson, 1979, pp. 1550-1551). The two theoretical positions (emotion vs. social) were used by Kraut and Johnson to make different predictions about the causes of smiling in social situations.

Kraut and Johnson chose to observe people in public settings where there were (a) frequent opportunities for happiness to be elicited and (b) frequent social interactions. Four studies were conducted: (1) observers watched bowlers to determine if they smiled more often in response to getting a good score (emotion hypothesis) or when engaged in face-to-face interactions with their friends and teammates (social hypothesis); (2) observers watched bowlers to determine if they smiled more often in reaction to their rolls when they were faced away from their friends or after they had turned to face their friends; (3) observers watched fans at a hockey game to determine if they smiled more often when the game was going well for their team or when they were interacting with other fans rather than watching the game; (4) observers watched pedestrians walking down the street to determine the extent to which the weather (pleasant or unpleasant) influenced the frequency of smiling and the extent to which socially interacting with another person influenced the frequency of smiling. The results from the four studies provided strong support for the hypothesis that social factors are more important than emotional factors in determining whether or not people

smile. Smiling was associated with "talking and looking at others in Study 1, facing fellow bowlers in Study 2, orienting toward other fans in Study 3, and talking to another person in Study 4. Smiling was found to be only erratically associated with a positive emotional experience. In other words, people smiled more often to other people than as a result of some pleasurable experience. Even when there was a pleasurable experience, the smile was directed to other people. The results suggest that smiling was more likely to occur in social interactions than as a response to an emotional experience. Even when the smile was in response to an emotional experience, it is still more likely to occur when the person was with someone else than when he or she was alone.

Another ethological study investigated greetings and found that smiling varied with the intensity of social contact (Kendon & Ferber, 1973). Greeters smiled more frequently in the first phase (distance salutation), which consisted of establishing a willingness to interact and in the third phase (close salutation), which was a prelude to conversation, than during the middle phase (approach phase), when the greeters were walking toward one another. Kraut and Johnson (1979) argued that these findings are better explained by the social hypothesis than by the emotion hypothesis. First of all, smiling occurred when the people are showing a willingness to interact with each other. Second, the rapid shifts in smiling are difficult to explain from the emotion hypothesis.

In another study (Mullett, 1986) smiling was found to vary depending on the degree of social involvement that was about to ensue.

Subjects who were going to be working together on a task smiled at each other sooner and more frequently than subjects who were going to work individually on a task.

Bugental (1986) found faster offset times for smiles of women who had interacted with an unresponsive boy than for smiles of women who interacted with a responsive boy. It was suggested that when the adult's conversational leads were unreciprocated the adult would withdraw from the interaction (including nonverbal behaviours such as smiling). This suggests that smiling may be part of the initiation to interaction and if it is not reciprocated or if interaction does not begin, the smile is more likely to be withdrawn. (It is also possible that the boys did not reciprocate the smile and this resulted in the withdrawal of the women's smiles, however, it is not possible to determine this, as Bugental did not examine the boys' nonverbal behaviours as they responded to the women.)

Brightman, Segal, Werther, and Steiner (1975) found that subjects' facial expression corresponded to their evaluations of sweet or salty sandwiches only when they ate them in the presence of other subjects. There was no change in facial expression when the subjects ate alone. This occurred for even the highest levels of tastants (136% sugar or 110% salt). The authors concluded:

These experiments indicate that communication remains an important factor in the expression of gustofacial reflex in adults. (p. L 141)

Kraut (1982) was interested in whether the mere presence of another person would enhance facial expressions. In order to avoid

possible confounding by display rules, subjects were asked to smell a number of different odors that varied in pleasantness/unpleasantness while they were either alone or in the presence of another person who could not see them. He found "overall, facial expressions from senders who were in the presence of others were neither more or less readable than those from senders who were alone" (p. 60). Although Kraut designed this as a test of communicability of facial expressions, one can argue this is not a true test because there was in fact no receiver available for the communication. The other person could not see the expression and the subject knew this.

Bavelas, Black, Lemery, and Mullett (1986b) found that motor mimicry or the expression of empathy (e.g., a wince for someone else's pain) was differentially affected by the visual availability of a receiver and its display was synchronized to this availability. When the experimenter who had "hurt" himself made eye contact with the subject, the subject exhibited a display that was either maintained or was increased in intensity. When the experimenter did not make eye contact with the subject, the subject either did not exhibit a display or exhibited a display that decreased in intensity.

The above studies investigated facial displays that occurred in social interactions where participants were together but not talking with one another. The only study that has examined the effect of visual availability on facial actions that occur in conversations is that of Rime (1982). In this study, subjects could either see each other or were separated by a wooden screen. They were asked to discuss their opinions of movies and what they liked to see in the

cinema. Eyebrow movements and smiles were included in the nonverbal behaviours that were measured, and although the frequency for both variables was lower in the nonvisibility condition, the differences were not significant. Rime used non-parametric statistics to analyze his data, but did not give any reasons for this decision. When the results were re-analyzed by the present author using a t-test, significant differences between the two conditions were found for both the frequency of eyebrow movements and smiles. Although these results would not have been significant in Rime's study due to the need to control for alpha inflation (27 variables were scored), they do suggest that some facial actions will decrease when the other person is not visually available.

In summary, there is considerable evidence to support the communicative function of certain kinds of facial expressions and displays. However, many of studies are limited in that only smiling was examined. In addition, only one study has investigated the effect of social determinants on facial actions as they are used in conversations, but the facial actions of interest were limited to eyebrow movements and smiles.

The purpose of the second study was to test the hypothesis that occurrence of facial displays is determined by social factors. One goal was to expand on the previous research by examining the effect of social factors on a specific reaction display rather than just eyebrow movements and smiles. The kind of display chosen was the motor mimicry display. Motor mimicry is defined as "overt behaviour by an observer that is appropriate to the situation of the other rather than

to the observer's situation" (Bavelas, Black, Lemery, & Mullett, 1986a, p. 102). Mimetic displays include not only displays shown by the listener that are similar to the displays produced by the other person but also displays by the listener that the other person might have produced. As noted earlier, Bavelas et al. (1986b) found significant variations in the pattern and display of motor mimicry depending on whether there was a receiver available to see the display. The stimulus used to invoke mimetic displays in their study involved an enactment of an injury. The "victim" (one of the experimenters) dropped a heavy TV monitor on an injured finger (bandaged with a splint). The stimulus elicited displays of wincing and grimacing. The present study was designed to expand on the kind of mimetic displays that can be elicited by using different stimuli to evoke these displays. Rather than having the subjects watch an enactment, subjects provided their own stimuli by telling about a close call incident they had had experienced. The present study also expanded on the Bavelas et al. study by examining mimetic displays that occur in the context of a conversation.

A second goal was to incorporate the various ways the social nature of a situation can be manipulated so as to be able to compare their effects on frequency of facial displays. Different social conditions can be created by varying whether or not there is a receiver who can see the display (Cohen & Harrison, 1973; Cohen, 1977). One condition included in the present study involved having people interact face-to-face (i.e., a receiver was visually available). Visual nonavailability of a receiver can be produced in

two ways. One way would be to let the participants interact in the same room but to interfere physically with their ability to see each other. This is similar to Rime's (1982) study. The other alternative is to separate the participants (put them in separate rooms) and let them interact over a telephone or intercom system (Cohen & Harrison, 1973). The first option provides a more precise experimental manipulation of the independent variable without adding any other differences between conditions (such as the medium of communication). Talking in a room together while not being able to see each other however, is an unfamiliar and somewhat odd way to interact for most people. It is possible that this oddness may disrupt the conversation and affect the frequency of displays. It is also possible that subjects may treat the situation as if they were interacting face-to-face and therefore facial displays will not be affected. Talking over a telephone is a more familiar means of communicating than the first option and would probably be more natural and comfortable than the first option. Interacting over a telephone system also tests whether facial displays are affected when the medium of communication is also altered. Because both options have advantages and disadvantages, two nonvisual conditions (Partition and Telephone) were included in the study. In one condition subjects were separated by a partition and in the other condition subjects interacted over the telephone. Social conditions can also be varied by creating a nonsocial condition where there was no receiver available. This condition enables the researcher to examine any differences between the condition where there is someone to interact with and to see the display and a

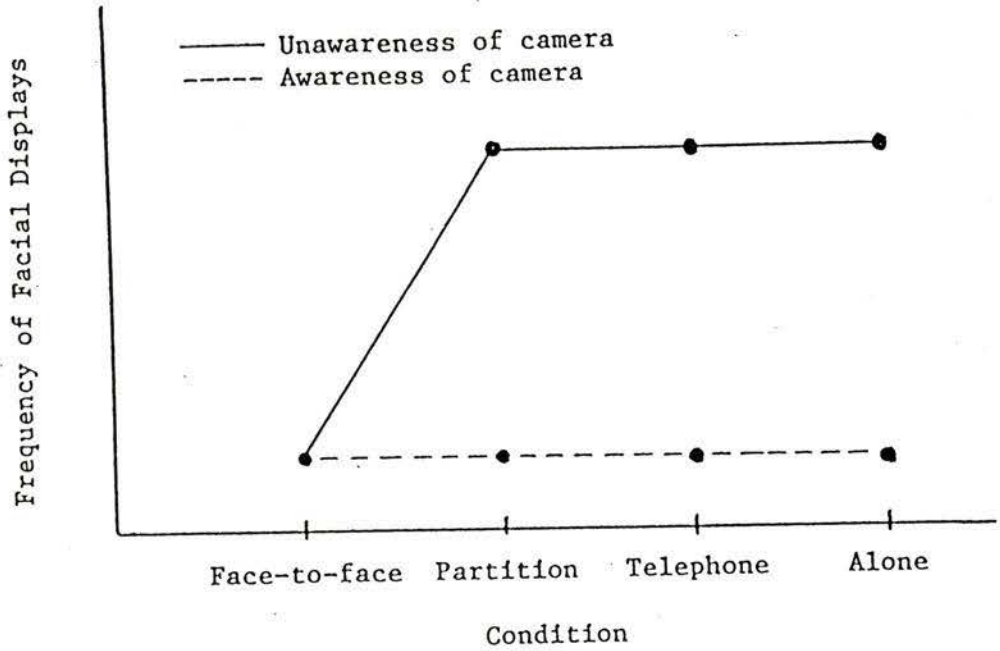
condition where there is no person to interact with and see the facial display. Therefore a fourth condition in which there was no other person to interact with was included.

In summary, the social nature of situation can be placed on a continuum ranging from a full face-to-face interaction, to partial interactions, to a noninteractive situation. In the present study there were four experimental conditions:

1. Face-to-face interaction. Subjects were seated across from each other at a table.
2. Partition interaction. Subjects were seated facing each other at two adjacent tables that were separated by a partition that was approximately five feet (150 cm) high.
3. Telephone interaction. Subjects were seated in separate rooms and talked to each other over a telephone system hooked up between the two rooms.
4. Alone condition. The subject was seated at a table that held a tape recorder and a telephone. The subject heard a tape-recorded story and gave a recorded message of her own.

Models of Facial Displays

There are a number of different outcomes that can be predicted, depending on what processes are hypothesized to underlie the occurrence of facial displays. Figures 1 and 2 illustrate the hypothetical results for each of the experimental conditions predicted by four models of facial displays (emotion/masking, channel



MODEL 2. CHANNEL VARIATIONS

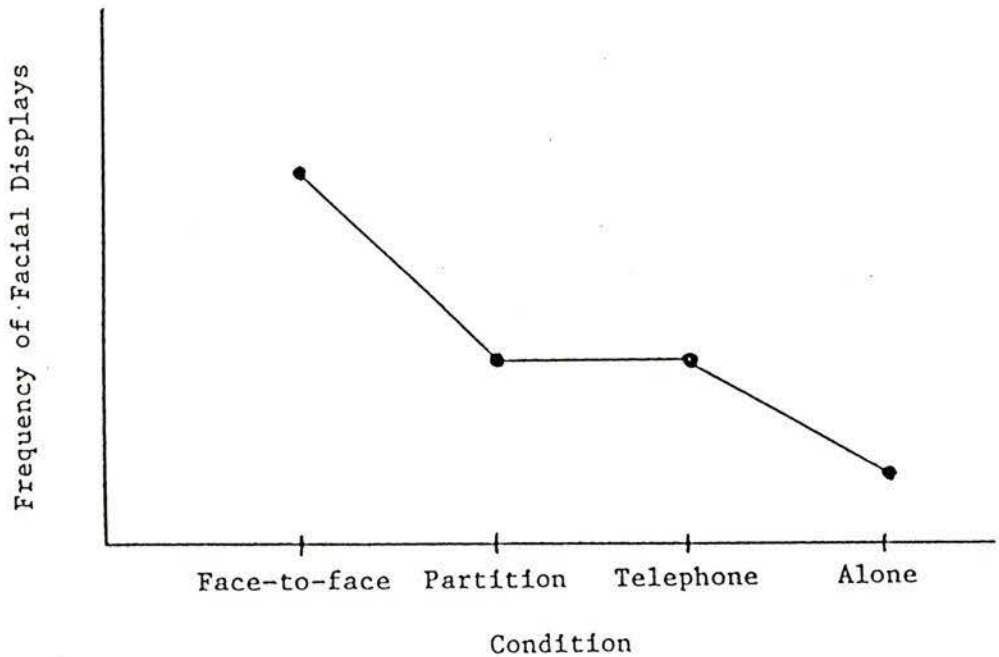
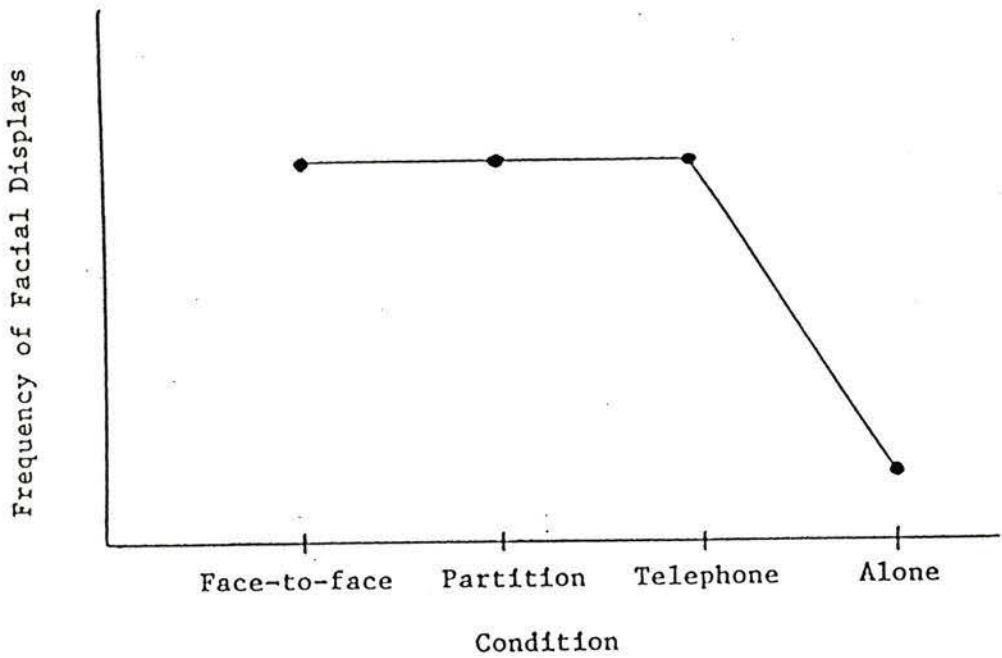


Figure 1. Facial Display Models 1 and 2 and Predicted Frequency of Displays in the Four Conditions.



MODEL 4. VISUAL AVAILABILITY OF A RECEIVER

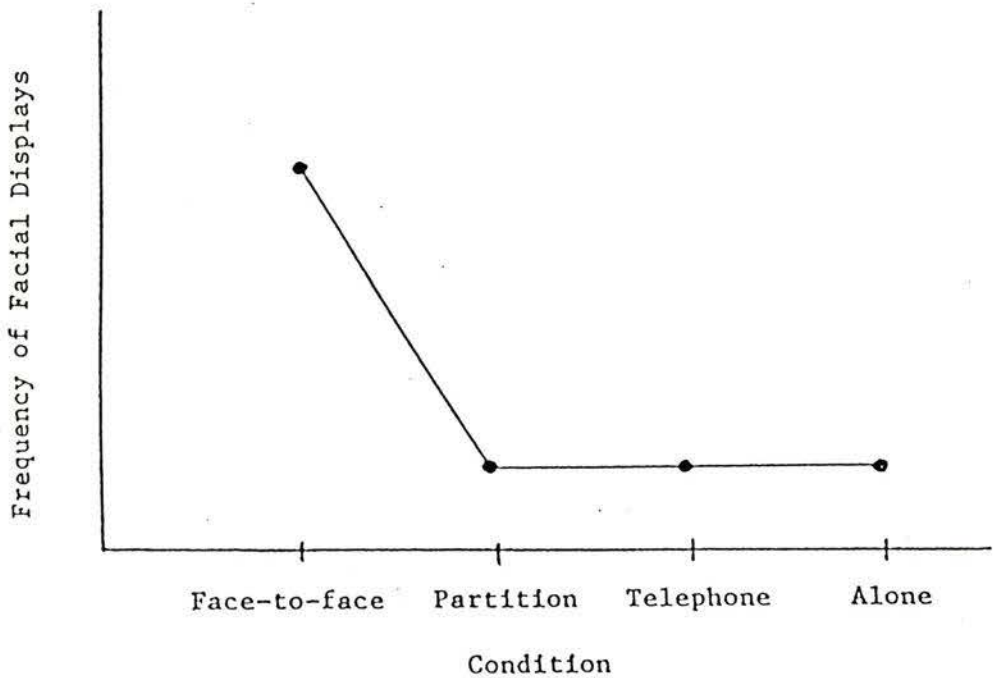


Figure 2. Facial Display Models 3 and 4 and Predicted Frequency of Displays in the Four Conditions.

variations, interactive/noninteractive, and visual availability of a receiver).

An emotion/masking model (Model 1) is based on the assumption that people will be more likely produce facial displays when no other person is present who can see the display. Therefore this model would predict that the frequency of facial displays would be highest in the condition in which the subject was alone (and therefore there would be no need to mask or hide any displays), moderately high or equally high in the two conditions in which a receiver was not visually available, and lowest in the Face-to-face condition. If the subjects were aware they were being observed or videotaped, this model would predict a low frequency of displays across all four conditions.

Model 2 (channel variations) is based on the hypothesis that facial displays are a function of how communicative the situation is (in terms of the number of channels available, for example, auditory, visual). Facial displays are assumed to occur most frequently in face-to-face situations. In situations where the visual channel is removed, the frequency of displays will decrease but some may still occur because the situation is still fairly social. A further decrease would be expected when the situation becomes completely nonsocial. This model would predict a decrease in frequency of facial displays from the Face-to-face condition to the Partition and Telephone conditions (with no difference between the Partition and Telephone conditions because medium of communication would not be expected to affect frequency of displays) and a further decrease in the Alone condition because it does not involve another person at all.

Model 3 (interactive/noninteractive model) is based on the hypothesis that having another person to interact with elicits facial displays. This model predicts a high frequency of displays for the three conditions in which there was another person to interact with and a low frequency in the condition in which there was no other person.

Model 4 (visual availability of a receiver), which is the one proposed by the author posits that visual availability is the important factor underlying the occurrence of facial displays. This model leads to the prediction that the frequency of facial displays would be high in the Face-to-face condition and low in the other three conditions, in which there was no visible receiver.

Study 2

Method

Subjects

Ninety women participated in the study. All were University of Victoria undergraduates. Their ages ranged from approximately 17 to 50 years, although most were in their early twenties. They were recruited either through the Psychology Department Volunteer Subject Pool or by canvassing a second year Anthropology class and a third year sociology class. To avoid any possible gender effects, which were not the focus of this study, only women were recruited.

Ten pairs were randomly assigned in permutations of three to each of the three conditions involving dyads. Subjects were assigned to the Alone Condition when only one subject could be booked or when only one of a dyad showed up for the study. There were ten dyads in the three social conditions (Face-to-face, Partition, and Alone) and ten subjects in the alone condition. One dyad in the Face-to-face condition had to be replaced because the subjects blocked the view of each other's faces. Two dyads in the Partition condition had to be replaced because one subject in each dyad looked down and it was not possible to see their faces⁴. Two dyads in the Telephone condition had to be replaced; one because of sound problems and one because a subject looked down and it was not possible to see her face. Ten subjects had to be replaced in the Alone condition: for one, the videotape was accidentally erased; another did not follow the instructions to use the telephone; eight others looked down while talking and their faces were not visible to the camera. Dropping

these five dyads and ten individuals left the N at 70 (30 dyads and 10 individuals). Note that in the dyads, only the first story told was used, so the number of subjects scored was 40, 10 in each of the four conditions.

Procedure

A potential participant was first asked on the telephone if she would be willing to participate in a study on conversations. It was explained that she would be joining another person (whom she did not know) and having a conversation about a couple of topics. (This study was run as part of a larger study; the data analyzed were for the second of the two topics.) The potential participant was told that these topics were not personal or intellectually difficult. The researcher explained that the conversation would be videotaped so there would be a record of the conversation. The person was informed that she would be shown the videotape afterwards and given a full explanation regarding the purpose of the study. If the person agreed, a time was arranged for her to come to the lab.

The study was conducted in the Human Interaction Lab of the Psychology Department at the University of Victoria. When the participants arrived, they were seated in the room and given one of four different instructions. (See Appendix C for transcripts of actual instructions.) In the Face-to-Face, Partition, Telephone conditions, participants were asked to tell about a "close call" or "near miss" experience that each of them had had (in the past). Specifically, they were instructed to talk about a situation in which something bad had almost happened or in which they had almost got hurt

but at the last minute everything had turned out all right. They were told that they should only talk about something that they felt comfortable in telling. If they could not think of a close call that had happened to them, they could talk about something that had happened to a friend or a close relative or something that they had heard about. The experimenter explained that they were to go into some detail about the close call and to make it into a story rather than just saying it in one or two lines. It was emphasized though, that they only needed to take a couple of minutes to tell about their close call. They could also take a minute or so to think and could decide between themselves who was going to start.

In the Telephone condition, the instructions differed only in that the subjects were told at the beginning that they would be having a conversation over the telephone. After the experimenter had given the instructions, one subject was taken to the other room.

In the Alone condition, the participant was told that she would be doing two tasks: she would first be listening to a short tape-recorded story and then she would be leaving a message on an answering machine. (Only the first task was analyzed.) The experimenter explained that the telephone message was unrelated to the first task of listening to the story. After the subject had listened to the story, she was to leave a telephone message for an imaginary friend about a "close call" incident that she had had in the past. She was to imagine that the close call had recently happened and that she was phoning the friend to tell him or her about it but the friend was not home and she had to leave a message on the friend's answering machine.

The rest of the instructions were the same as the instructions for the other three conditions.

When the participants were finished the experimenter came back into the room and explained that the study was over. The participants were then taken into the control room, shown the videotape, and given an explanation of the study. Subjects were then asked to sign a permission form on the use of the videotape for analysis.

Scoring

All tapes were scored for the frequency of motor mimicry displays. Only the first story was scored for the dyad data. Motor mimicry was defined as a display by the listener that was appropriate to the situation that was being described by the speaker. Specifically these were displays that might have been made by the speaker (or the person involved in the close call) as she was experiencing the situation being described. These listener displays, therefore, illustrated an appropriate reaction to the unpleasant event that was happening to the person in the story, for example, wincing at a description of the storyteller's being hurt. Displays that an observer would do as an observer (e.g., displays of concern) were not included as motor mimicry displays.

In prior research, only one type of facial motor mimicry has been investigated (Bavelas et al., 1986b). However, in the Bavelas et al. study, the displays were responses to fixed stimuli and thus only one kind of motor mimicry (in response to a pain stimulus) has been previously scored. In the present study, the displays were in response to varied stimuli (the different "close call" stories). This

meant that there were no previous data to draw upon as to the different types of motor mimicry displays that might occur. In the literature, motor mimicry has been defined quite generally, that is, it has not been limited to exact replications of the "victim's" display. Often there has been no mention of what the "victim's" display or reaction was (see Allport, 1968; Smith, 1759/1966). Therefore a fair amount of leniency was given as to what constituted a motor mimicry display. Two main criteria were used in the definition of motor mimicry: (1) any display that was an appropriate reaction to the negative event being described and (2) the display was one that might be made by someone in that situation. Displays that illustrated enactments of facial actions made by a character from the story (usually the main character described) were also included as motor mimicry displays. (See Results section for examples of these displays).

All tapes were scored by the author and a second trained scorer. Facial displays that were scored had to be noticeable in real time and not just "micro" actions. Actions around the mouth region had to be independent of actions associated with vocalization, that is, any action due solely to the formation of the mouth to vocalize words or sounds was not included as a motor mimicry display. Responses that only involved head movements (with no facial display) were not included as scorable facial displays. Facial displays that were arguably reactions to the process of telling the story were not included; for example, a display suggesting that the listener was having difficulty understanding the story was not included as a motor

mimicry display.

In deciding which of the scorable displays were motor mimicry, the scorers considered a number of different aspects of the display and its surrounding context. (See Appendix D for scoring instructions.) For the most part, mimetic displays were quite stylized and immediately followed a relevant statement made by the storyteller. When the display was less clearly motor mimicry, it was included if it was an appropriate response in the situation being described and it followed a relevant statement. Extremely ambiguous cases such as slight eyebrow raises, were not included as scorable motor mimicry displays. Eyebrow raises that coincided with the asking of a question were also not scored.

Tapes were scored independently by the two scorers and the frequencies of scored displays per story were correlated for the two scorers; $r = .94$. Examination of the two sets of scores revealed that the second scorer had recorded a higher mean number of displays than the author had. The videotapes were then reviewed, and differences were resolved. To avoid any possibility of scoring bias on the part of the author, this resolution tended more often to include rather than exclude additional displays identified by the second scorer. Displays scored as motor mimicry by the second scorer were excluded for the following reasons: two facial actions occurring sequentially with no break between them, which appeared to be in response to one utterance, were treated as one display; facial actions that were ambiguous as to what exactly the action was, for example, whether it was a smile or a slight grimace, were excluded; and actions due to

vocalizations were excluded. Of all the displays recorded by the second scorer, four Face-to-face displays, five Telephone displays, and one Partition display were excluded. Discussion of disagreements and review of the tapes also resulted in the inclusion of an additional Face-to-face display that had been previously excluded by both scorers.

Results

Description of Stories

The time taken by each participant to tell about her close call story ranged from one minute and five seconds to five minutes and thirteen seconds. Mean length of stories was two minutes and nine seconds in the Face-to-face condition, two minutes and fifteen seconds in the Partition condition, two minutes and twenty-four seconds in the Telephone condition and one minute and thirty-three seconds in the Alone condition.

Statistical Analyses

All quantitative results are based on the final set of displays after discussion. (All statistical tests were also applied to the second scorer's original data, and the results did not differ from the following.) The data were first analyzed by a one-way ANOVA, yielding a significant main effect, $F(3,36) = 5.41$, $p < .004$. The mean number of mimetic displays in each condition and the corresponding standard deviations and variances are given in Table 16. These results are also graphically represented in Figure 3. Inspection of the means for the four conditions resulted in immediate rejection of the emotion/masking model, which predicted an opposite pattern to the one

Table 16

Descriptive Statistics for Motor Mimicry Displays Across the Four
Conditions.

Face-to-face	Telephone	Partition	Alone	
Mean	3.6	1.2	0.5	0.2
SD	3.98	.92	.71	.63
Variance	15.82	.84	.50	.40

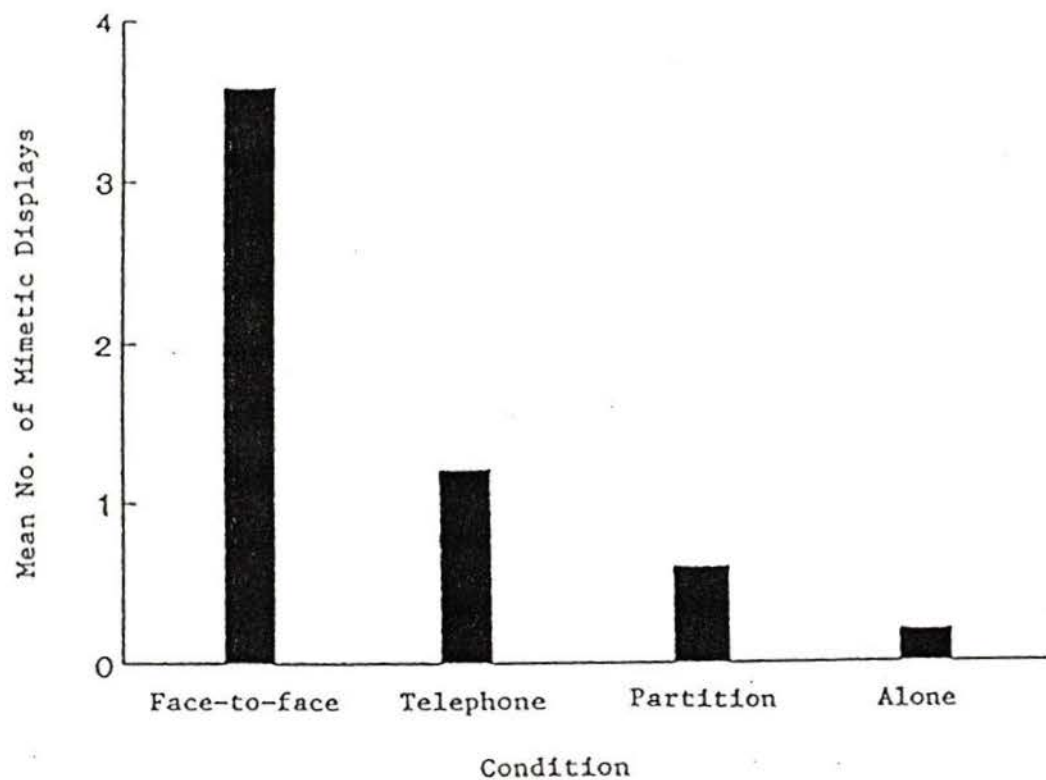


Figure 3. Mean Number of Motor Mimicry Displays Across the Four Conditions.

obtained. The second emotion/masking prediction based on the fact that the subjects were aware they were being videotaped was also not supported.

The five contrasts that were applied to test the three other models are presented in Table 17. The first contrast tested the difference between the Partition condition and the Telephone condition. The analysis revealed a nonsignificant difference between the two conditions, $F(1,36) = .56$, $p = n.s.$ therefore, these two conditions could be pooled together. A second contrast was used to test the difference between the mean of the two nonvisual interacting conditions (Partition and Telephone) and the Alone condition. A nonsignificant difference was found, $F(1,36) = .64$, $p = n.s.$ Thus Model 2 (channel variations), which predicted a decline in the frequency of displays from the Partition and Telephone conditions to the Alone condition, was rejected. A third contrast was employed to test the difference between the Face-to-face condition and the mean of the two nonvisual interacting conditions (the Partition and Telephone conditions). A significant difference was found, $F(1,36) = 11.48$, $p < .002$. Thus Model 3 (interactive/noninteractive) was not supported. A fourth contrast was used to test the difference between the mean number of displays in the Telephone condition (the higher of the two means for the nonvisual conditions) and the mean number of displays in the Alone condition. A nonsignificant difference was found; $F(1,36) = 1.14$, $p = n.s.$ A fifth contrast was employed to test the difference between the Face-to-face condition and the average frequency of the three other conditions. A significant difference was found, $F(1,36) =$

Table 17

Contrast Matrix Giving Weights (-1, 0, .5, 1) Applied to Five
Contrasts of the Mean Number of Motor Mimicry Responses for the Four
Conditions.

	Conditions			
	Face-to-face	Telephone	Partition	Alone
Comparisons/Means	3.6	1.2	0.5	0.2
C_1	0	1	-1	0
C_2	0	.5	.5	-1
C_3	1	-.5	-.5	0
C_4	0	0	1	-1
C_5	3	-1	-1	-1

15.03, $p. < .007$, accounting for 42% of the variation. Thus Model 4, which stresses the importance of visual availability in determining the occurrence of facial displays, was the only model supported by the data.

Some examples will illustrate the kinds of motor mimicry listeners displayed. Square brackets [] indicate when the display occurred.

Example 1 "Grimace" display. (eyebrows up, eyes squinted, mouth corners drawn back)

A: "... and I was brushing off her leg and I was leaning down, sitting down and I had my face like rig[ht by her foot right?] And it was her hind foot ..."

Example 2 "Portrayal of B looking for her mother" display.

(eyebrows up, eyes up and slightly off to her right)

(Note: A is the story-teller and B is the listener.)

A: ... so I wandered around across the street to find my mom. "Mom, mom, [Rusty's kicking me.]"

B: "I just got kicked in the eye."

Example 3 "Fear" display. (eyebrows raised, eyes widened)

B: "He drove, he drove too close and we had one front wheel off the cliff, [my side and the truck was going over the edge.]"

Example 4 Portrayal of A trapped between car and curb -- "panic" display. (eyebrows raised, eyes wide and looking down, mouth corners pulled back)

(Note: A is the story-teller and B is the listener.)

A: And I'm banging on the roof of his car [trying to get him to stop.]

B: Please

Discussion

The results of the present study supported the hypothesis that visual availability of a receiver is the important factor in determining the occurrence of facial displays. In the Face-to-face condition there was a significantly higher number of displays than in the Partition, Telephone, and Alone conditions. In terms of the models presented earlier, the results do not support the emotion/masking model, the channel variations model, or the interactive/noninteractive model.

It could be argued that the shorter duration of the story in the Nonsocial condition may be responsible for the low frequency of displays. However, there was one story in the Face-to-face condition that only lasted one minute and 20 seconds and yet seven displays occurred. If one assumed that there was a constant rate of displays, then increasing the length of the story should increase the number of displays. However, even if the duration of the story were doubled, the average number of displays in the Alone condition still would only be .4. The argument that there was less opportunity for facial displays to be exhibited in the non-interactive Alone condition also

does not account for the low frequency of displays found in the Telephone and Partition conditions and for the nonsignificant difference among the Telephone, Partition, and Alone conditions.

The reader should be aware that although the listeners in the two nonvisual conditions (Telephone and Partition) were less expressive than listeners in the Face-to-face condition, this does not mean that they were less responsive to the stories. Subjects in these two conditions tended to respond to the stories with verbal comments such as "Oh that's terrible" or "I can't believe that happened". This observation suggests that individuals were very responsive to the specific dynamics of the situation; subjects in the face-to-face condition responded facially (and sometimes verbally) to the stories, whereas subjects who could not see the speaker tended to respond verbally. Subjects in the Alone condition however, seldom made facial displays or vocalized. The few remarks that were made were typically said very softly, as if to themselves. This made sense given that there was no actual person there to respond empathically to. Future research might be directed towards verifying that individuals will shift their communication to the channel that is available.

CHAPTER 5

GENERAL DISCUSSION

The present studies were designed to provide an alternative approach to the study of facial displays. Historically, psychological research on facial expressions has been concerned with understanding facial displays in relation to underlying emotions that presumably cause the display. It is assumed (implicitly or explicitly) that the real function of the face is to express emotion; spontaneous facial expressions are involuntary "readouts" of an emotion process occurring within the individual. Within the general study of facial expressions, researchers have been interested in discovering (1) whether there were characteristic facial muscle patterns associated with particular emotion labels, and (2) whether naive judges could accurately guess the emotion being depicted by various posed facial displays.

As Fridlund (in press) pointed out, underlying psychological theories of facial expressions is a model in which a distinction is made between two possible kinds of facial expressions, although both kinds convey emotion information. The first consists of facial expressions which convey information about an emotion that is occurring at the time of the display. These "true" facial expressions of emotion appear to be regarded more as a nonverbal behaviour than a nonverbal communication (Wiener, Devoe, Runbinow, & Geller, 1972). The facial expression is conceived of as a behaviour that is more connected to processes internal to the individual than to any social processes. It is the underlying emotion that causes the display. The

second kind of expression is one that is not connected to a corresponding emotion but, rather, is a deliberate or intentional display produced to give the impression that the individual is experiencing that particular emotion. Ekman and Friesen (1969b) have argued that individuals will sometimes mask what they are feeling with a facial expression of a different emotion, for example, masking pain with a smile. The individual may also produce a display of emotion for the purposes of illustrating that emotion; the display is in case is considered to be an emblem rather than a "true" emotional expression (Ekman, 1973). These "intentional" expressions (i.e., the masked displays and emblems) are regarded as communication. They are held to be the result of conscious and intentional action on the part of the individual rather than being spontaneously produced. Implicitly, they are viewed as less "real" expressions than the first type (presumably because they are less tied to an ongoing emotional response). Ekman argued (and provided some evidence) that the intentional displays differed from spontaneous emotional expressions in their timing, duration, and stylization. Thus, although both types of facial expressions convey the same information, they are differentiated on the basis of physical features and inferences of intentionality.

In psychological theories of facial expressions, the "true" (spontaneous) emotional expression is one that is unaltered by any social processes. Therefore, in order to obtain "true" emotional expressions it is important to minimize social influences by ensuring that the person is isolated and unaware that he or she is being

observed. These procedures avoid facial displays that occur in the presence of others which may not be the "true" emotional expressions but rather might be masked, simulated, or emotion emblems (Ekman, 1973). Social displays (i.e., masked or simulated expressions or emblems) have been of less interest than spontaneously occurring emotion displays.

It is also interesting to note that conversational facial displays (i.e., displays that convey non-emotion information) are at best only briefly mentioned in this approach. Implicitly, the absence of any discussion of non-emotion displays leaves the reader with the idea that facial expressions convey only emotion information.

On the other hand, the approach taken in ethological, interpersonal approaches, and the present research is based on a model of communication. The interest is in how displays are linked to the social situation. The difference is that the previous approach looks within the individual to understand the display, whereas the second approach looks outside the individual to the social interaction for understanding. Facial displays are assumed to occur in social interaction, where their purpose is to convey information that can be used by others. Within this approach, facial displays appear to be regarded more as nonverbal communication than as nonverbal behaviour. Displays are regarded as communication that is sent within a sender-receiver relationship (minimum two people). No assumptions about possible connections to underlying processes are made. The major focus is on understanding how facial displays are used by persons (and animals) in their social interactions.

Both the individual and social approach to the study are useful to the understanding of facial displays. One approach is not necessarily better than the other; rather, they should be viewed as providing different information about facial displays. Historically, though, the individual approach has received vastly more attention. The studies described in this dissertation were an attempt to begin to rectify this situation.

The primary assumption underlying this research is that facial displays are communicative behaviours; they occur in interactions with other people, and their primary function is to provide information in the ongoing communicative exchange. The purpose of the research was to discover the kinds of linguistic functions these displays serve in interactions. This functional analysis is in keeping with a general functional perspective advocated first by Darwin (1965/1872). Although Darwin was more interested in survival functions of displays, he also proposed that facial expressions are signals that communicate information and that they play an important role in language, that is, they give "vividness and energy to our spoken words" (p. 364).

The present study differs from the majority of previous studies on facial displays in two specific ways: (1) the displays obtained in the sample were spontaneously produced and (2) they occurred in social interactions.

The present research was a first step toward the integration of verbal and nonverbal communication. This has been advocated by a number of researchers (e.g., Humphries & Brannigan, 1972; Scherer, 1980; McNeil, 1985) who have pointed out that separation of verbal

from nonverbal is conceptual rather than actual. The problem of separating verbal and nonverbal behaviours arose in the scoring of the data obtained in the second study. Many of the motor mimicry reactions observed were a combination of various behaviours that could only be separated arbitrarily. The verbal and nonverbal responses given by the participant in the interaction formed the whole communication.

Examination of facial displays in the context of what was being said was a step toward learning how verbal and nonverbal processes work together to provide communication. The results of the first study suggest that facial displays function syntactically by organizing the verbal content and can also provide semantic information that either illustrates or adds to the verbal content.

The functional scoring system developed in the first study expand on the work begun by Ekman and others on non-emotion functions of facial displays. The findings of this study demonstrate that the face is used to communicate more than just emotion information. Support was found for Fridlund and Gilbert's (1985) proposition that that face provides information that adds to the verbal component of communication rather than to provide emotion information. Recall that in Ekman and Friesen's unpublished study, only one-third of facial expressions were emotional in content (Fridlund, Ekman, & Oster, 1987). In the present study, out of a possible 1184, only 208 (18%) were found to convey information about a personal reaction (the closest category to emotional reactions).

In addition to information about personal reactions, other kinds of information were found to be conveyed facially. The information may be, for example, about what the person is doing at that moment (e.g., thinking), or it may nonverbally convey verbal expressions or phrases (e.g., "I don't know."). This information may be independent of the verbal content, or it may accentuate or illustrate the meaning conveyed by the words.

Within Ekman and Friesen's (1969b) categorical system, some of these displays could be classified as emblems, for example, the facial shrug. Displays classified as speaker illustrator displays in the present study would probably fall into Ekman and Friesen's category of illustrators. Syntactic displays would also probably be placed into their illustrator category. They provided information vital to the overall understanding of the verbal content. Listener comment displays are similar to Ekman and Friesen's (1969b) category of regulators and Ekman's (1979) listener conversational signals. Listener facial displays can provide a great deal of information that would disrupt the speaker if it had to be conveyed verbally. Facial displays solve this problem by allowing the listener to contribute to the interaction without disrupting the ongoing utterance or having to speak at the same time as the speaker. The messages sent by the listener provide the speaker with information about whether he or she is being understood (or not understood), whether the listener agrees (or disagrees), what the listener's reaction is to what is being said, etc. While the listener may at times interrupt the speaker to make a point, there are also many times when the listener does not want to

interrupt yet must provide feedback to the speaker. Sending messages through facial displays provides an effective and satisfactory solution to this problem.

One particular class of information provided by listener displays occurs in a situation where the listener must convey a specialized kind of understanding. Motor mimicry displays are displays produced by the listener that convey the information "I understand how you feel or what you're telling me". The displays are more efficient than words because they convey this information much more precisely and eloquently than if it were said verbally. In this case, the picture is worth a thousand words.

Adaptors (or self-adaptors) observed in the present study were similar to ones that have been found in previous research. Although it has been assumed that adaptors have no communicational value, there was a suggestion in the present study that some may function as a message that the person will not interrupt. It could be that some adaptors are communications like Smith's (1977) tongue showing. Smith demonstrated that tongue showing is a display that sends the message "Please do not interact with me." Similarly, some adaptors may used as a message by the listener, one that says "I will not interrupt you." However, this was only hinted at in the present study, and empirical confirmation of this hypothesis needs to be obtained.

The results of the present study confirm Ekman's (1979) finding that eyebrow actions play a large role in the syntactical functions. Almost all of Ekman's speaker conversational signals were found in the present study. Facial displays were found to provide grammatical

information, for example, marking that the utterance is a question or providing emphasis as to what should be taken as the main point in the utterance. The only exceptions were Ekman's categories of punctuators and clause markers (Ekman also did not find any clause markers). An additional kind of information was found to be conveyed in the present study, information that helped to structure larger units of the verbal content. These displays marked changes in the verbal content such as beginning a new topic, getting back to the story after getting off topic, and finishing the topic at hand. They may function to help the listener to know where the conversation is going. They may also facilitate understanding by helping the listener to anticipate what will be said next and to follow along without getting lost or confused.

Scherer's (1980) proposal that nonverbal signs serve syntactic and semantic functions was supported. In addition, some facial displays (story announcement, continuation, and ending) appeared to serve the dialogic function proposed by Scherer, that is, they served to organize and structure topics within the conversation.

An interesting finding was that there were no typical anatomical patterns of facial action for any of the linguistic functions, with the exception of eyebrow movements typically serving syntactic functions. For the majority of other functions, the results are similar to Landis' findings (1924a; 1924b); recall that he did not find any standard facial patterns for the emotional reactions elicited in his studies. A similar finding was observed in the present study for the majority of displays conveying other kinds of information.

The first study in the present research has provided us with a better picture of how facial displays function to organize and clarify communication by providing different kinds of information. It is possible that additional functions may also exist. The present research is limited in that only three topics were examined and that the conversations were between strangers. Future research could be directed towards expanding on the topics and investigating conversations between participants who have an established relationship. For example, close friends or married couples may communicate other kinds of information facially.

The second study was designed to explore a different aspect of facial displays. The first study was an inductive one, designed to discover the kinds of communicative information provided by facial displays; the second study was a deductive attempt to test empirically the extent to which social processes regulate the occurrence of facial displays. It was hypothesized that if facial displays are socially elicited, then their frequency of occurrence should be affected when the social nature of the situation changes. Specifically, it was predicted that the frequency of facial displays would vary depending on whether there was another person who could see the display. The results supported the author's prediction that the visual availability of a receiver was the most important determinant of facial displays. Facial displays of motor mimicry occurred significantly more often in the condition where there was a receiver who could see the facial displays than in the other three conditions, in which the other person either had no visual access to the displays or there was no other

person in the situation. This finding supports the model in which visual availability is the most important social factor. There was no significant further decrease in the frequency of facial displays found in the situation where the person was alone. The results do not support a model based on the assumption that that occurrence of facial displays will decrease as the number of channels (visual, auditory) is reduced or a model based on the assumption that displays are solely dependent on whether individuals are just interacting or not interacting. The emotion/masking model was also not supported by the results from the second study. Participants decidedly did not mask or cover up their displays when there was another person present, nor did they show an increased frequency of facial displays when in the room alone. The results of this study demonstrate that, at the very least, people will be more facially expressive in some situations where there is another person present. Previous research differed from the present study in that past studies have used social settings that led to inhibition or masking of displays. The results from such research has painted a picture that portrays people in social situations as either displaying "misleading" expressions or as being expressionless. The situation used in the present study (telling about a close call) was one in which it would have been seen as uncaring or insensitive not to respond in an empathic way (verbally or nonverbally). Therefore the social setting used in the present study was one which facilitated the use of facial displays. The present study also differs from previous research in that the participants were equal in their status in the experiment and there was no need to be

nonexpressive. Unlike the previous studies, there was no possibility of embarrassment in the present study.

Kraut (1982) did not find a difference in the frequency of facial displays between the condition in which the subjects were alone and the condition in which subjects were in the same room but could not see each other. The present study confirmed this finding; there was a nonsignificant difference in the frequency of facial displays between the Alone condition and the Partition condition. The findings from both studies suggest that communication via facial displays requires more than just the mere presence of someone. The determining factor in eliciting facial displays appears to be the two individuals must be able to see each other.

The results of the second study echo the findings of Kraut and Johnson (1979) who found that people smiled more when they were engaged in face-to-face interactions or oriented toward other people than when they were turned away from their friends or not oriented towards other people. In both the present study and Kraut and Johnson's studies, having someone to see the display increased the likelihood that a display was made. The results of the present study are also consistent with the findings of Brightman, Segal, Werther, and Steiner (1975) that people are more likely to make displays when in the presence of others (who can see them) than when they are alone.

The results specifically replicate the findings of Bavelas, Black, Lemery, and Mullett (1986b) that visual availability is an important determinant of motor mimicry displays. Here, listeners who could see (and presumably establish eye contact with) the speaker made

more displays than listeners who could not see the other person or had no other person to interact with. The study extends the previous finding to a more naturalistic situation than was used in the Bavelas et al. study and to a variety of motor mimicry displays.

This study has confirmed Buck's (1984) suggestion that situations can be set up that do not interfere with the production of facial displays but rather increase the likelihood of their occurrence. Future research might be directed toward discovering the parameters of situations in which certain facial displays are more or less likely to be produced. One parameter would obviously be to vary the relationship between the participants. Culture is obviously another important determinant of social "appropriateness" for a number of behaviours including displays. There is no doubt that, even within our North American culture, there are certain circumstances in which some displays are considered to be socially inappropriate.

In addition, it might be better to view facial displays in terms of information management or information control rather than in terms of "display rules". People select the information they want to give to others, if only for the reason that some questions would take forever to answer if all the details were given. For example, Turner, Edgley, & Olmstead (1975) found that verbal information control in conversations was used for a variety of reasons: to protect one's "face" or the "face" of another person, to control the relationship between the interactants, to avoid tension with the other, or to control the interaction. Facial displays may be produced or not produced for these same reasons and probably a host of others. Both

cross-cultural and within-culture research would help to sort out the issue of when information is conveyed on the face.

Another direction for future research might be to examine how listener reaction displays are elicited by the discourse of the speaker. In the present research, one important variable that appeared to affect whether or not listener mimetic reactions were elicited was the extent to which the speaker provided details in the story (verbally or gesturally). Stories which were told very generally did not appear to elicit very many (if any) listener mimetic reactions, whereas stories in which the speaker would describe in detail what happened would often elicit a number of mimetic displays. Varying how a story was told would provide a good test of this hypothesis.

In summary, the above studies have provided us with further knowledge of how people use facial displays in social interactions to convey information that can be used by others.

Footnotes

1. As Ekman, Friesen, and Ellsworth (1982a) pointed out, emotion is a nebulous concept and there has been little agreement as to how it should be defined. Most investigators of facial expressions of emotion would agree, however, that emotion consists of a number of different components such as eliciting stimuli, and physiological responses, as well as subjective, facial, and behavioural components.
2. Judgements about the message sent by the expression (other than information about an emotion or trait) are not considered by the judgement approach.
3. The various theorists have differed on the definitions and use of the terms emotion and affect. However, for the purposes of this review, the two terms will be considered interchangeable.
4. An interesting although frustrating finding was that subjects in the conditions where the other person could not be seen or there was no other person often looked down at the table. Although this appeared to be a natural way to sit and talk when no other person was present, for the purposes of this study it was essential to have a clear view of the subject's face and therefore this behaviour necessitated replacing all subjects whose faces were obscured.

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APPENDIX A

Study #1 Instructions to Subjects

What you will be doing today is having a conversation together and while this is going on I will be videotaping so you'll get to see yourselves on TV afterwards. Any questions?

What I'd like you to do is for the two of you to talk about a number of different topics - which I will give you, but first I'd like the two of you to introduce yourselves and just get to know each other for a few minutes - what courses you're taking, what year you're in, hobbies, or whatever you want to talk about. After a couple of minutes I'll come back in and give you some other topics to discuss.

(Experimenter leave room.)

Now I'm going to go through and tell you about each of the topics you will be discussing. I'll go over each of them now and in case you forget I'll leave this sheet as a reminder. I only want you to spend a few minutes on each topic so you don't need to go into any long stories. I will knock on the door if you are going on too long, that will be a signal for you to move on to the other person or the next topic.

First I'd like the two of you to plan a nutritious meal together. I want you come up with appetizers, soup course, main course, and dessert. Now I want you to plan this meal using only foods that you dislike or think you would dislike. The two of you can combine your foods together to create a meal.

After this I want you each to retell a conversation that you have had with someone that involved a minor conflict. Now I don't want you to

talk about a serious argument that you had with someone but rather a disagreement or minor argument. It could be an argument that you had with a store clerk or some administrative person, whatever. I'd like you to re-enact the conversation by repeating what the two of you said to each other, for example, I told him: "I sent you that form last week." and he said: "Well I never received it." Again, remember to keep it relatively short.

Following this I'd like the two of you both to discuss a close call or a near miss incident that each of you have had. Now I don't want you to talk about something bad that actually happened to you, but rather a situation in which you almost had something bad happen but at the last minute everything turned out okay. Now if you can't think of anything that happened to you personally, then you can talk about something that happened to a relative or friend, or something you heard about.

Okay, that's it, any questions? When you are through talking about these topics I'll come back in and that will be the end of the study. I'll leave this sheet with the topics on it for you in case you forget. And remember you needn't get into any long involved stories as you only have about 15 minutes altogether.

Suggestions for conflict situation

Store clerk

University Administration

Professor

Bank, Telephone Company

Close call

While driving

Playing sports

Riding a bicycle

Computers

APPENDIX B

Permission Form to Keep Videotape

Project: Facial Actions

Nicole Chovil

Please indicate below the way(s) in which we may use the videotape made during this experiment. You may select some and not others — or none at all. Your experimenter will explain in detail what each might consist of.

Your tape would be identified only by subject number. The sheet that connects your name with this subject number will be kept separately in a secure place. Obviously, however, videotapes are not anonymous to anyone who knows you.

_____ analysis by the research team
(Nicole Chovil and assistants).

_____ viewing by other subjects
who rate various verbal
and nonverbal aspects.

_____ playing as an example for
professional audiences (e.g.
at a professional presentation at
another university).

_____ playing as an example for
classes at U.Vic.

_____ still photographs in
journal articles or books.

_____ all of the above.

_____ none of the above; please erase the tape.

Signature _____

Date _____

Experiment Number _____

Group Number _____

APPENDIX C

Training Instructions for Scoring Function of Facial Displays

List of Facial Display Categories

Paralinguistic - Syntactic markers, independent of content.

Emphasizer

Underliner

Question Marker

Offers

Sentence Change

End of Utterance

Pronunciation Correction

Comma

Story Announcement

Story Continuation

End of story

Topic Change

Speech Correction

Speaker Comment — Nonredundant with any of the verbal content.

Personal Reaction

Thinking/Remembering

Facial Shrug

Interactive

Metacommunicative

Qualifier

"Yes"

Speaker Illustrator — Redundant with part or all of the verbal content.

Personal Reaction

Portrayal

Thinking/Remembering

Facial Shrug

"Yes"/"No"

"Not"

"But", Qualifier, Clarification

Listener Comment — Displays by the listener while the speaker is talking.

Backchannel

Personal Reaction

Motor Mimicry

Understanding

"Yes"

Agreement

Adaptor — Displays which appear to have no linguistic information.

Instructions for Scoring Displays

You will be scoring the general category the facial display belongs in and the specific category the facial display belongs in, as well as providing some justification for your choice of each. You will need to write down a summary statement or enough information that describes why you placed the display into the categories (general and specific) you chose. You must be able to defend or justify your decision. You can paraphrase what was said, or summarize the context it occurred in, or give a transcription indicating where the display occurred. Examples of what you could write down are: display is portraying "I'm cool", person is acknowledging what was said; speaker talked about getting hit by car, eyebrow adds emphasis in utterance "She said that was okay", talking about raw fish, telling about something said in the past. For adaptors you only need to write down what the action was, for example, lip bite, scratches eyebrow, etc.

General Categories

There are five general categories: Syntactic, Speaker Comments, Speaker Illustrators, Listener Comments, and Adaptors. Within each category are a number of specific categories. You must first make a decision about what the general category the facial display belongs in. Then you have to decide what specific category the facial display belongs in. To do this you have to decide what kind of information is being conveyed by the display. It is important to stay very close to what is being said verbally and also use the rest of the context as well.

Syntactic Displays

Syntactic displays are facial displays that serve syntactic functions, that is, they are usually connected with intonation or the syntactical aspect of the utterance. Syntactic displays can be recognized by their placement in the utterance and by the fact that they do not appear to add any meaningful content to what is being said. Word emphasis/stress and question markers are the most common Syntactic displays. Word emphasis displays can be recognized by the fact that the facial action (usually eyebrow movements) co-occur with one word that is stressed usually with intonation as well.

Underliners are displays that emphasize a clause or part of an utterance. Again, usually the person also uses intonation as well.

Question marker displays help to indicate that the utterance is a question or is to be taken as a question. The facial action may occur with one word or may be held for the entire question. Comma/pauses

displays are facial actions that occur where there is a pause or where a comma would be placed in the utterance. Sentence change displays

are displays that occur when the person changes what he or she was going to say. The person begins his or her statement but then stops midway through and begins a new statement. The facial display usually

occurs when the person begins the new statement. Pronunciation

correction displays occur when the person mispronounces a word. The facial display occurs when the person repeats the word using the

correct pronunciation. Story announcement, continuation, and ending

displays are facial displays that mark the organization of the topic.

Story announcement displays occur with the introduction of a story.

Story continuation displays occur with conjunctions such as so, but, then, so anyways, etc. They appear to indicate that the speaker is moving on to another point or idea. Story or topic ending displays mark the ending of the topic.

Speaker Comments

Speaker Comments are facial displays that add information that is not redundant with the verbal content. The display usually accompanies verbal content; however, occasionally a Speaker Comment can occur without words, for example, neither person is speaking and one person raises his or eyebrows as if to say "Well, now what do we do?" Be careful not to confuse these with Listener Comments (see Listener Comments section below). When Speaker Comments accompany verbal utterances the information given by the display is different from the verbal content. The main point to remember is that Speaker Comments do not illustrate or repeat what is being said. Speaker Comments are nonverbal ways of expressing an idea or thought. They are nonverbal equivalents of spoken utterances.

Speaker Comments can be personal reactions to something that is happening at the time of interaction. For example the person could make a disgust display while talking about eating raw fish or could frown to indicate uncertainty while discussing what foods he or she dislikes. Other personal reactions can be evaluations about what is being said (e.g., disagreement, uncertainty). When the display is an emotion display, it must be connected to something that is occurring at the time, that is, it is not a re-enactment of a past emotion display, i.e., one that occurred in the past (a re-enactment is a

Speaker Illustrator). Another type of Speaker Comment is the facial shrug. These are displays that indicate comments such as "What can I say?", "Too bad.", "I don't know.", etc. Often these displays will consist of eyebrow flashes. Thinking/remembering displays are those that indicate that speaker is recalling something from memory or is thinking about what he or she will say next. Interactive displays are displays which attempt to include the listener in the interaction, for example "You know?" or "Well, what now?". Metacommunicative displays are displays that tell the listener how to take a message, for example, the person is being sarcastic or that the person is only kidding. Analogic "no/yes" displays are displays that indicate a "no" comment by the speaker, it is the equivalent of the speaker saying "No/Yes" or "Not really."

Speaker Illustrators

Speaker Illustrators are facial displays that illustrate something that is also being verbally conveyed. The information being given by the display is at least partly redundant with the information given by the verbal content. A Speaker Illustrator forms a visual picture of what the speaker is saying. For example, a person could be saying "That's disgusting." while at the same time, displaying a disgust face. The verbal content may also provide information that forms the context for how the display should be interpreted. For example, it may be obvious from the verbal content that the speaker is re-enacting a past conversation and so the facial display is an illustration of this conversation. Another example is when the speaker hesitates and says "Um, ah, I'm not sure" and lowers his or

her eyebrows at the same time.

Specific categories include personal reactions, thinking/remembering, metacommunicative, and analogic "not". In addition, there are portrayal displays. These are displays that are re-enactments of someone not present or something that occurred in the past (portrayal of something the speaker did or said in the past is also included in the category). The display may indicate that the speaker is taking the role of another person and his or her speech; it is as if the speaker was putting quotation marks around the utterance. The display can also be a re-enactment of behaviours or an emotion display that occurred in the past.

Listener Comments

Listener Comments are facial displays made by the person who is not talking at the time. They are responses to something said by the speaker. The person is considered to be a listener when he or she says either nothing at all or gives a comment that has no substantial meaning to it, for example, "Oh really", "That's interesting." If the person comments for any longer, he or she should be considered a speaker.

Listener Comments will sometimes be backchannel displays which are displays that indicate that the listener is following/listening. Sometimes the backchannel display will accompany a verbal backchannel (e.g., um, yeah, mmmm). You will have to decide whether the listener is conveying any information by what he or she says or if the verbal content is just a backchannel comment (for example, when the listener says "yeah"). In order to make this decision you should check such

things as whether the speaker has tried to elicit a response from the listener or if the speaker treats what the listener has said as a response. If the speaker makes no reaction to what the listener said, but rather just continues on as if it didn't occur, then the listener's verbal content is probably just a backchannel response. Also listen closely to the intonation, it often provides clues as to whether the person is responding to the speaker's utterance or just acknowledging that something was said (for example, how enthusiastic does the person sound?). Listener Comments can also serve as personal reactions to what is being said, including whether or not the listener understands. These displays can either stylized displays or may just mark the comment. Verbal reactions to a speaker's utterance can be distinguished from back channels by how enthusiastically the listener responded. This will help you to decide whether the display marks a back channel or personal reaction. Motor mimicry displays are displays that are appropriate to the situation being described by the speaker; it is as if the situation were happening to the listener. Wincing while listening to a story involving someone being hurt is an example of a motor mimicry display. Understanding displays are displays that indicate the listener understands and appreciates the situation being described by the speaker; these displays may indicate sympathy or "I know what you mean."

Adaptors

Adaptors are facial displays that do not appear to be connected to anything in the interaction. They have no meaning value. The action may occur to reduce physiological discomfort or may be a result

of another action, for example, scratching. The most common are lip wipes and biting the lip. They will often occur after the person has finished speaking or while the other person is talking. If they occur in the middle of an utterance, they may also function as a comma. If so, note both.

Miscellaneous Category

If it is not possible to code a display in the above categories, that is, the display does not seem to fit into any of the above categories, you should leave the category sections blank but write in the "Comments" section anything that might help to understand it's function, e.g., where the display occurred; always at the end of the speaker's utterance. Your idea of what the display seems to convey or do.

Categories and Examples

Syntactic (Displays that serve syntactic functions.)

Emphasizer (One word is stressed)

Underliner (Clause or part of the utterance is stressed)

Question Marker (The facial action may occur with one word or can be held for entire question)

Comma/pauses

Sentence Change (Person changes how he was going to say something; begins sentence but then changes to say something different; facial action occurs before or when

person starts new sentence)

Pronunciation Correction

Story Continuation (Facial display occurs with
connecting words such as so, but,
then, so anyways, etc.)

Speaker Comment (A display which gives information that is
nonredundant with the words.)

Personal Reaction (A reaction to something that is
happening right now, e.g., this
task.)

Examples Puzzlement
 Present Anger
 Present Irritation
 Uncertainty
 Amazement
 "This is difficult."
 Evaluation - positive or negative
 Dislike
 Disgust
 "This is silly."
 "It's not that great/terrific."
 "Could have been bad."

Facial Shrug

Examples "What can I say?"
 "Too bad"

"I don't know."

"What else?"

"What more can I say?"

Can't think of anything

Thinking/Remembering

Examples Recalling from memory

"I'm thinking."

Trying to remember

Interactive

Examples "You know?"

Nonverbal Question — Well, what now?

Metacommunicative

Examples "I'm only kidding/This is a joke."

Sarcasm

Clarifying impreciseness/approximation of
verbal description

Analogic "no/yes"

Examples No (nonverbal)

"Not really"

Speaker Illustrator (A display which gives information
that is redundant with the words.)

Personal Reaction

Examples Exasperation

Dismissing something — "It's nothing."

Uncertainty "I think"

Excitement

Certainty

Displays of present emotion (reaction to something right now)

It's horrible/terrible.

Difficulty in explaining

Dismissing something — "It's nothing."

Portrayal

Examples Taking the role of another person and his/her speech; as if putting " " around the words (can also include past speech of the speaker).

Re-enactment of behaviours that occurred in the past (pantomimes, facial/head gestures, etc.).

"I'm cool."

Display of emotion that occurred in the past.

Thinking/remembering

Examples Word/idea Search "Ah, ah, raw fish, ah, sushi."

"Well there is one."

Metacommunicative

Examples Modifier of verbal description - e.g, downplaying of verbal content

Analogic "no/yes"

Listener Comments (Displays that are given by the listener.)

Backchannel (Displays given by the listener that let the speaker know the listener is following.)

Examples Acknowledging Displays (may include Oh, yeah, Mhmm)
Interest/Attentiveness
"I'm listening"
Okay

Personal Reaction

Examples Don't understand
Agreement/Disagreement
That's interesting
Metaphoric surprise/disbelief
Astonishment/Surprise — "Oh really?"
Amazement
Boring — "Nothing exciting"

Motor Mimicry (Displays that are appropriate to the situation being described; it is as if situation were happening to the listener.)

Examples Wincing, fear, horror, etc.
Concern

Understanding

Sympathy

"I know what you mean."

Adaptors (Displays that have no meaning value, action occurs to reduce physiological discomfort or for some reason unconnected to the ongoing talk.)

Examples Lip Wipe
 Lip Bite
 Pulling lips in
 Facial actions that result from
 scratching, etc.

Examples of Scoring Facial Displays

DY: 7
 SX: M/M
 TI: 3:00
 TOP: Getting Acquainted
 CAT: Speaker Illustrator
 SPC: "How do I say this?"
 FA: Brows lowered
 SP: B
 DIS: B
 CNT: B: ... get in without it, it's not mmm it's not
 behaviourism or anything like that.

COM:

DY: 7
 SX: M/M
 TI: 10:07
 TOP: Getting Acquainted
 CAT: Syntactic
 SPC: Question Marker
 FA: Brows raised
 SP: B
 DIS: B
 CNT: B: Not any type of fish?

COM:

DY: 7

SX: M/M
TI: 7:14
TOP: Dinner Planning
CAT: Speaker Comment
SPC: "I can't think of one."
FA: Right side of mouth pulled back (twitch) then eyebrows raised
SP: Neither
DIS: B
CNT: B's trying to think of a soup he dislikes, makes display then B: I can't think of anything for soup, I I...

COM:

DY: 7
SX: M/M
TI: 22:11
TOP: Close Call
CAT: Listener Comment
SPC: Motor mimicry
FA: Mouth forms O shape, eyebrows lowered slightly
SP: B
DIS: A
CNT: B: ... falling on the street and then having this car car go over top. A: Wow.

COM:

Appendix D

Study #2 Instructions to Subjects

Version 1 + 2 Face to face and Partition

What you will be doing today is having a conversation together about various topics which I will give you and while this is going on I'll be videotaping so that I can have a record of everything and you'll get to see yourselves on TV afterwards. Any questions?

[For the first topic participants were told to imagine that a friend was having a dinner party and wanted their opinions on what foods should be included. Participants were given a list of foods and asked to comment on whether they had tried the food or if they would be willing to try it.* When they had finished giving their opinions on the foods, the experimenter came back into the room and gave the instructions for the second task.]

For the second topic I would like both of you one at a time to tell about a close call incident or a near miss incident that you have had. Now I would like you to talk about an incident in which you almost got hurt or something bad almost happened but in the end everything was okay or an incident where the injury or outcome was only minor compared to what it could have been. I want you to talk about only something that you feel comfortable in telling. If you can't think of anything that happened to you personally, you can talk about something that happened to a relative or friend, or something you heard about. Other people have told about skiing accidents, falling off a horse, close calls while playing sports, one person talked about how she almost lost her paper in the computer. You can

take a minute or so to think about one you've had. I'd like you to describe the situation in some detail, make it into a story, don't just say in one or two lines. Any questions? When you have both talked about your close calls, I will come back in and that will be the end of the study.

Okay, you can start any time after I leave the room.

*After the first set of instructions was given in the Partition condition, one participant was asked to sit on the other side of the partition.

Version 2 Telephone

What you will be doing today is having a conversation over the telephone with each other about two topics which I will give you and while this is going on I'll be videotaping so that I can have a record of everything and you'll get to see yourselves on TV afterwards. Any questions?

Okay, I'm going to explain what you will be doing and then I will be taking one of you into another room where there is another phone.

[For the first topic participants were told to imagine that a friend was having a dinner party and wanted their opinions on what foods should be included. Participants were given a list of foods and asked to comment on whether they had tried the food or if they would be willing to try it. When they had finished giving their opinions on the foods, the experimenter came back into the room and gave the instructions for the second task.]

For the second topic I would like both of you one at a time to tell about a close call incident or a near miss incident that you have had. Now I would like you to talk about an incident in which you almost got hurt or something bad almost happened but in the end everything was okay or an incident where the injury or outcome was only minor compared to what it could have been. I want you to talk about only something that you feel comfortable in telling. If you can't think of anything that happened to you personally, you can talk about something that happened to a relative or friend, or something you heard about. Other people have told about skiing accidents,

falling off a horse, close calls while playing sports, one person talked about how she almost lost her paper in the computer. You can take a minute or so to think about one you've had. I'd like you to describe the situation in some detail, make it into a story, don't just say in one or two lines. Any questions? When you have both talked about your close calls, I will come back in and that will be the end of the study. This time you <point to subject who was in little room> can go into the other room. You <point to subject who will be in the main room> can talk about your close call first. Just wait a minute or so before buzzing.

Okay, you can start any time after I leave the room.

Version #3 Alone

What you will be doing today is a couple of tasks that involve leaving a telephone message for someone. While this is going on I will be videotaping so that I can have a record of the study and you'll get to see yourself on TV afterwards. Any questions?

[For the first topic the participant was told to imagine that a friend was having a dinner party and wanted her opinions on what foods should be included. The participant was given a list of foods and asked to leave a message on an imaginary answering machine about whether she had tried each of the foods or if she would be willing to try them. When the participant had finished giving her opinions on each of the foods, the experimenter came back into the room and gave the instructions for the second task.]

For the second topic I would like you to leave another message, this time about a close call incident or a near miss incident that you have had. Imagine that you just had this close call and you want to tell your friend about it. Now I would like you to talk about an incident in which you almost got hurt or something bad almost happened but in the end everything was okay or an incident where the injury or outcome was only minor compared to what it could have been. I want you to talk about only something that you feel comfortable in telling. If you can't think of anything that happened to you personally, you can talk about something that happened to a relative or friend, or something you heard about. Other people have told about skiing accidents, falling off a horse, close calls while playing sports, one person talked about how she almost lost her paper in the computer.

You can take a minute or so to think about one you've had. I'd like you to describe the situation in some detail, make it into a story, don't just say in one or two lines. Any questions? When you have finished telling about your close call, I will come back in and that will be the end of the study. You can start anytime after I leave the room.

APPENDIX E

Scoring Instructions for Study #2

Checklist for Scoring Motor Mimicry Displays

1. The first thing to do is to determine whether there is a facial display that might be Motor Mimicry. Include only those in which there is a fairly obvious action, in other words, ignore tiny flicks or actions.
2. Then you must decide whether it is unambiguously a motor mimicry. Remember if you find you're having a difficult time doing this, it may mean that it is ambiguous.
3. Remember to watch the display in real time and remember your initial reaction to seeing it. Then you can decide whether you need to go and look at it again. Be aware that in some cases you have a real close up of the face or the person may be fairly far back and that this may affect your judgments.
4. Sometimes the decision will involve considering a number of features that will vary for each display.
5. Clear M/M displays usually involve more than one part of the face (although not always) and they may be dramatic or consist of exaggerated muscle movement. Clear M/M can also consist of unique facial displays that clearly have one meaning, e.g., eyes widening usually suggests a fear display. Clear M/M displays are displays that are very appropriate to the situation. It is as if the person herself was in that situation or is enacting a display that is appropriate to that situation. It illustrates well an "empathic" reaction to the situation e.g., wincing at pain or disgust display at something gross.

It doesn't have to be the one you would do or the story-teller would do but rather one that a person would do in that situation.

6. M/M displays may also occur with words, the person may illustrate something she is saying, and it could be a M/M display. Remember though, it has to be relatively unambiguous.

7. Be alert to the fact that the face can change quite quickly.

There may be one display which then changes into another which may be scorable. Try to translate or classify the displays as you see them.

8. A simple display such as raised or lowered eyebrows could mean a number of different things, raised brows may reflect curiosity, interest, mild surprise, etc. Lowered brows could mean anger, worry, puzzlement, etc. Therefore you have to decide if there is more than just a simple small action (for example, a M/M display could consist of raising and drawing together eyebrows as in a hurt display) and if the display reflects a clear cut meaning. For example, exaggeration may make it clearer.

9. Closing eyes unless held for more than one second or shut tightly is ambiguous. Unless the above conditions hold or there is clearly other action as well, do not score eyes closed as M/M.

10. If the display could be something else such as a listener comment such as not understanding or interest but could also be M/M, then it is not clearly M/M and should not be included.

11. Be careful that there is in fact a clear facial display — if only the mouth and the person is vocalizing, then check to see if it is necessary to form the mouth that way to say the vocalization. For example, saying something like oooww or exhaling and laughing wouldn't

probably be scored as a M/M display. However, remember that just because the person vocalizes, does not mean that you can automatically say no display has occurred.

12. Sometimes the person will vocalize primarily, but there still might be slight movement in the face. If it is only tiny then don't call it a M/M display. Remember, faces don't have to stay absolutely still, so if the face doesn't change much then call it a vocalization. You'll need to make a judgement about as to whether it is primarily vocal or both facial and vocal. It may mean excluding some displays.

13. Be on the look out for Portrayal or Enactments done by the listener.

In summary, remember that a facial display may not be scored as M/M for three reasons:

- (1) it is ambiguous because it only consists of a simple action (e.g., brows are raised slightly)
- (2) the facial display could be M/M or it could be a listener response such as puzzlement or not understanding and you're not sure.
- (3) the vocalization carries most of the meaning and the facial movement is very slight.

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Social Sciences and Humanities Research Council Doctoral Fellowship	1987-88
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British Columbia Post Secondary Award	1987

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Title of Dissertation: Communicative Functions of Facial

Displays in Conversation

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